

## Measuring The Pulse Of DP

By Catherine Armat  
Of the CW staff

The use of minicomputers vs. larger mainframes is by far the major interest of DP personnel, according to the results of the Computerworld poll of reader interests [CW, April 16].

A consensus was also found concerning IBM's entry into the satellite communications area—but at the other end of the scale. Managers, DP managers, programmer/analysts and other members of the computer community consistently rated this category last in their list of choices. The poll offered 14 areas to be ranked according to preference, with 1 denoting the highest interest, 2 the next and so forth. Obviously, the items with the lowest averages were the items of highest interest.

A total of 468 ballots were tallied, with replies from 88 managers, 212 DP managers,

107 programmer/analysts and 61 others.

It was not required of voters that all categories be ranked; those left blank were not taken into account when figuring averages. Consequently, although 468 ballots were received, only 345 rated minicomputers.

The total number of votes, however, remained consistent with the ranking of each category by average. For example, minicomputers received the largest number of votes as well as the lowest average, and IBM's satellite entry received the least votes and the highest average.

The training of DP people was second, with the highest interest expressed in the programmer/analyst and DP manager sections.

There was a wide difference between the conversion from batch to online systems, which ranked third, and future communication (Continued on Page 5)

# COMPUTERWORLD

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M ... I ... C ... N ... C ... C ...

Join us — and Mickey and his friends — in a quick review of next week's National Computer Convention to be held at the Anaheim Convention Center. Complete coverage begins on Page 33.

## Software Patent May Go to High Court

By Don Levitt  
Of the CW staff

WASHINGTON, D.C. — The question of whether software can be patented may be heading back to the U.S. Supreme Court.

Acting for Patent Commissioner G. Marshall Dann, Solicitor General Robert H. Bork has asked the justices to review and presumably put aside last October's decision by the Court of Customs and Patent Appeals (CCPA) that a software system invented by Thomas R. Johnston of Iowa was patentable when described as "apparatus" [CW, Oct. 9].

Johnston's program, a financial record-keeping system which employs a digital computer, is neither "apparatus" nor a "machine," Bork argued; it is merely an idea and "ideas are not patentable, whether claimed as processes or as products."

Further, "because of its immediate impact on computer programming, [the CCPA] decision would have a serious adverse effect on the computer industry and thus on the economy at large.

"More generally, the decision's implications could have a serious adverse effect

on competition in the use of business and other ideas," Bork claimed.

The Solicitor General's plea — technically a petition for a writ of certiorari — has now been formally opposed, however, in another brief filed with the high court by Johnston's lawyer, Morton Jacobs of Millman and Jacobs, Philadelphia.

Because the "new use of an old machine" issue raised in Bork's plea was not considered by the CCPA, the Supreme Court is "without jurisdiction to review" the lower court's ruling, Jacobs contends.

As of last week, the Supreme Court had not announced if it would review the specific decision on Johnston's program or the basic question of patent protection for any software.

Johnston's program enables banks to provide basic accounting information to small business clients, based on codes added to the normal string of magnetic ink characters along the bottom of the client's checks and deposit slips. The software provides subtotals by category code as well as more conventional totals on the client's entire bank account during each

## Afips' Glaser Sees DPMA Enhancing Future NCCs

By Edith Holmes  
Of the CW staff

SAN MATEO, Calif. — With the addition of the Data Processing Management Association (DPMA), the American Federation of Information Processing Societies (Afips) has gained a society with considerable potential for influencing the technical programs of future National Computer Conferences (NCC), according to Afips' outgoing president, George Glaser.

In reviewing his two years as president of the federation of 15 nonprofit, professional societies, Glaser considered the election of DPMA and of the Institute of Internal Auditors, Inc. one of the two significant accomplishments of his administration.

"Their membership will strengthen Afips significantly by providing an increased voice for data processing users

and members of DP management in our programs, projects and conferences," he said.

"The federation will be better able to represent the entire U.S. information processing community in addressing matters of broad concern to the advancement of computer science and data processing as responsible professions," he added.

DPMA, in particular, will join Afips, the Association for Computing Machinery, the IEEE Computer Society and the Society for Computer Simulation in planning and sponsoring the now-annual NCC, Glaser stated.

### Second Gain for the Year

The opening of Afips' Washington, D.C., office marked the second major accomplishment for the federation during this past year, Glaser commented.

The Afips board of 21 directors and four officers has charged the office with three primary functions: "providing Washington information service to the Afips constituent societies; establishing contact with members of government agencies and congressional staff and making technology-related expertise available to the Afips constituent societies and their constituents; and undertaking personal contact, in formal hearings and informal meetings, with government agencies and congressional staffs as a means of providing information directly to these groups."

Glaser said he was "pleased that the board of directors has decided to fund the office for 30 months of operation" and suspected the directors would consider further financial assistance if the office serves the purposes for which it has been designed.

"The office should be able to provide constituent societies with information on pending legislation, research grants, legislative hearings and seminars and symposia," he remarked.

Previously "a little thin," Afips' constant presence in Washington will mean more formal testimony by the federation before agencies and congressional committees, Glaser indicated.

In keeping with Afips' status as a tax-exempt, scientific and educational organization with a constitution that prevents

(Continued on Page 4)

### reporting period.

Bork's plea noted that the codes used by Johnston's system are assigned by the client ("analogous to customer's writing 'rent,' 'fuel' or the like on each check . . . or deposit slip," a footnote suggested), and the program implementing the idea "coax[es] with an ordinary computer in an ordinary way."

To this Jacobs countered, "Even under [Bork's] procrustean argument, the government does not have any rational basis to arrive at a universal rule that machines built by programmed computers are not patentable."

Two and a half years ago, the Supreme Court disallowed a patent for a program developed by two engineers at Bell Laboratories. The Benson-Tabbot patent was rejected because the program involved was "essentially a series of mathematical calculations or mental steps" and not a process that could be patented.

In writing the court's unanimous opinion on that case, however, Justice William O. Douglas cautioned, "It is said the decision precludes a patent for any program servicing a computer. We do not so hold."

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Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5000. Telex: 92-2529.

**OTHER EDITORIAL OFFICES:** England: computerworld, c/o IBC Europe, Ltd., 140-146 Camden Street, London NW1 9PP. Phone: (01) 485-2248/N. Germany: computerworld, c/o Computerwoche GmbH, 8000 München 40, Tristenstrasse 11. Phone: 36-4036/37. Telex: 5213350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinjyuku-ku, Tokyo 141. Phone: (03) 4454-101. Telex: 36792.

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President/Publisher: Patrick J. McGovern  
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## With Every Teller On-Line

## Three-Bank Town Moves Toward EFTS

By Edith Holmes  
 of the CW staff

**FREMONT, Neb.**—Every teller in this three-bank city has been on-line since last March to a system that handles all banking transactions at every location.

Believed to be the only community in the country where all banking facilities are linked to one system, Fremont has taken the first step toward a statewide network for the electronic transfer of funds, according to Don Dillon, manager of the Information Management Division of the National Bank of Commerce in Lincoln, Nebraska.

The First State Bank of Fremont, the Fremont National Bank and the First National Bank of Fremont are three of some 165 banks in the state that have opted for the telecommunications services provided by the National Bank of Commerce, Dillon said. In addition to service bureaus in Fremont and Lincoln, the bank has established computer centers in North Platte and Grand Island, he explained.

At its headquarters in Lincoln, the bank's DP division works with a Burroughs B4700; in Fremont and at the other two centers, the system operates on Burroughs B3700s.

The bank tellers in Fremont are equipped with 50 Burroughs TT 500 Teller Terminals (TT) which give them access, via three direct, local lines and standard Bell Telephone and Burroughs 1,800 bit/sec modems, to the Fremont Computer Center mainframe.

Eventually, Dillon noted, the terminals will be linked to the CPU through a Burroughs 774 front-end processor. He also said the National Bank of Commerce is considering the use, in Fremont and elsewhere, of Burroughs' TTY-type terminals and NCR's latest teller machines.

## Only the Beginning

The bank's project in Fremont began when the first bank went on-line in July 1974 and was completed when the last bank in the city was added to the system this spring. Dillon noted it only takes thirty days now to put a bank on-line.

"Fremont is representative of the end of phase 1 of our efforts to establish the communications network," Dillon stated. "Phase 2 involves connecting the four computer centers in the state to a single line and should be completed by this fall. "Once the centers are linked, we'll be

able to handle same-day postings on automated clearinghouse items," he added. In addition, the National Bank of Commerce plans to offer the bank's teller services in-house printers for any hard copies of documents they require. The bank is seriously considering Burroughs TC 4000 printers for this purpose, he said.

Dillon noted the National Bank of Commerce has one direct competitor, also based in Lincoln, First National Bank, but, has established a large-scale distributed processing system in preparation for an eventual statewide Electronic Funds Transfer System.

The primary difference between the First National and National Bank systems, according to Dillon, is his competitor's use of Incomet terminals. "We considered Incomet devices, too, but didn't go with them because they require tellers to leave their stations. With Burroughs terminals, tellers don't have to move around and so can handle all transactions that come their way," he said.

While the bank's system relies on a CRT-accessible central information file containing all customer names, addresses and accounts, Dillon indicated security has not and should not be a problem. "Each instrument in the system has an address, and an operator has to know the

appropriate message format to access the data base," he stated.

He added that, beyond the core of applications provided by a group of standard financial packages called Control 7 from United Data Services in Alabama, any additional programming for the entire system is accomplished at the Lincoln center and elsewhere else.

Dillon said the reactions of bank tellers, customers and management to the network have all been favorable. "Tellers don't have to walk away from their stations; customers can get any balance information they need from the teller, eliminating the previous need to walk all over the bank in search of the bookkeeper; and managers have graphic charts generated by the system which summarize the number and time of transactions and the stations where they occur, facilitating staffing and other management decisions," he commented.

Beyond a few line problems, the network has worked as smoothly as was expected, according to Dillon. He said Burroughs had provided "early good service support," and indicated the real test of support would come as the network extends into the more remote areas of Nebraska.

## Police Chief Indicted on Charges Of Altering Own Record at CRT

**CINCINNATI**—Symmes Township Police Chief James Tygett, accused of deleting a reckless-driving offense from his record in the county's regional computer system through a CRT terminal [CW, March 19], has been indicted by an Ohio state grand jury for tampering with government records.

Tygett was released on personal recognition following the indictment, and no trial date has been set, according to Carl Volman of the Hamilton County Prosecutor's staff.

The alteration was discovered during a routine inspection of a printout at the terminal where the charge was originally entered, a security procedure built into the system, according to Andrews O. Atkinson, superintendent of the regional computer center.

That terminal is located in the traffic division of the county clerk's office, where Tygett often used the terminal to check citations issued in Symmes Township, Ronald Wiczorowski, an employee of the county clerk of courts, said.

He added, however, he could not prove Tygett was at the computer terminal on the day the record was altered.

"He's been coming in there for months," Wiczorowski said. "I cannot say definitely he was there on that day."

"There may have been an occasion or two when another police officer used [the terminal], but not on a regular basis," he added.

Tygett, who has maintained his innocence, took a lie detector test in Louisville, Ky., which he said "vindicated" him.

## On the Inside This Week

## NEWS

Glaser Assails DPs for Lack of Self-Development ..... 4  
 Maryland Senate Kicks Price-Marking Bill ..... 5  
 Personalized DP Diets Wage Battle of the Bulge ..... 6

## EDITORIAL

Editorial: An All-IBM Capability? ..... 8  
 White Hat, Black Hat: And Having Writ Moves On ..... 9  
 Taylor Report: Doctors Shift Billing Problems ..... 9

## SOFTWARE &amp; SERVICES

TVA Tunes 360/50 Operations, Then Goes to RUE 30 ..... 15  
 HP RTE-III Adds Multitasking Multiprogramming ..... 16  
 Many Utility Packages Too Good Not to Use ..... 18

## COMMUNICATIONS

DEC Software to Provide Distributed Processing Basis ..... 19  
 MCI Adds Management Functions for Private Line Nets ..... 22

## TERMINAL TRANSACTIONS

IBM 360/50 Bank System Gets Printer ..... 23  
 Tellers' Use of CRTs Reduces Transaction Time ..... 25

## SYSTEMS &amp; PERIPHERALS

Entrex 380 Boosts Bureau's Productivity 35% ..... 27  
 Pilot Call Program Under Way in UK Grade Schools ..... 29  
 System Calculates Discounts for Liquor Wholesaler ..... 30

## MINIWORD

VIP-100 'Understands' Human Speech ..... 31  
 Nova to Help Guide Panama Canal Ships ..... 31  
 HP 3000 Reduces Financial Risks in Resources Search ..... 32

## COMPUTER INDUSTRY

Two Surveys Present Varied Views of User Spending ..... 66  
 Vocational Specialization Working at NCR ..... 66  
 Disk Cartridge Prices at Plateau ..... 67  
 Potential Mini Users Unaware of Makers ..... 68  
 Microdata Peripherals Expects \$5 Million Revenues ..... 69

## FINANCIAL

Potter Seeks Court Protection ..... 70  
 Sperry Reports Record Sales, Net for Year ..... 78

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## Competent People 'Becoming Less So'

## Glaser Assails DPs for Lack of Self-Development

By Nancy French  
Of the CW Staff

SAN FRANCISCO—DP professionals face the same problem as Alice on her journey through Wonderland: "It takes all the running you can do to stay in the same place and twice the effort to get ahead," according to George Glaser, retiring president of the American Federation of Information Processing Societies (AFIPS).

Glaser shared some other unsettling observations on the information processing systems environment with Computer Caravan attendees at a luncheon here last week in one of his final appearances before turning over AFIPS leadership to a new president in Anaheim next week.

Noting that his remarks were personal, Glaser praised several hundred Caravan workshop participants for taking the time to attend, share ideas and solve problems together. Unfortunately, Glaser noted, the majority of DP professionals do not share that interest in self-development and "are not preparing themselves for what lies ahead."

## Poorly Qualified DPs

"There are a distressingly large number of poorly qualified people today developing complex systems to which we will all be exposed," Glaser warned. "Those who are competent are becoming less so every day as technological development threatens to overwhelm us," he said.

Universities are turning out far too few qualified people, he said, and the long-term prospects in DP are not promising enough to attract top people, he explained.

Finally, "we are having a painfully difficult time achieving the level of professional maturity necessary to help stimulate and reward the continued self-renewal of individual competence," he said.

The problems existing in DP are just as apparent today as they were when he cited them in his keynote address at last year's National Computer Conference, he pointed out.

Glaser called upon DPs to recognize that professional development is each individual's responsibility.

Those who recognize it and do nothing about it will end up in the same boat as those who don't recognize it at all—in jobs that are drudgery, afflicted with myopia and tunnel vision," he said.

Systems are infinitely more complex today than ever before, he said. We are nearly unable to manage the complexity

that surrounds us and soon may engulf us, he said.

Mathematicians love complexity—they solve it by breaking down complex problems into simpler problems they know how to solve, he pointed out. But arbitrary complexity, defined by Frederick P. Brooks, chairman of the University of North Carolina's Department of Computer Science, is another matter.

Quoting Brooks, Glaser said "Arbitrary complexity is the result of a very large number of independent decisions and events occurring over long periods of time which produce cumulative and unpredictable effects on the environment."

any lobbying effort, however, he stressed the information provided to agencies and any other organizations will be restricted to technical information which may be used in arriving at policies by these groups, but which will not constitute policy guidance per se.

The director of the office and the office itself will be "AFIPS' eyes and ears, but not its mouth," Glaser explained. Director Philip Nyborg will "listen for and identify those opportunities where AFIPS volunteers might provide information for technical, not political, debate."

In assessing his presidency, Glaser identified two key areas which he felt AFIPS had neglected this year. Citing the field of "personal development," he specifically would like to see the board of directors



The federation's Washington office "will be AFIPS' eyes and ears, but not its mouth. [Director Philip Nyborg] will listen for and identify those opportunities where AFIPS volunteers might provide information for technical, not political, debate."

Two areas of such complexity are found in the computing environment, Glaser said. First in the operating system where "it is impossible to know what is going on under any realistic set of conditions at any point in time."

A second area of arbitrary complexity can be found in business DP—"where the environment in which people function is linked to behavior of thousands of individuals whose behavior, in turn, is linked to the behavior of still thousands more."

Rather than learning a new computer language when you have a few spare

hours, why not study some books about human behavior, Glaser suggested.

There are no simple solutions, Glaser explained, but surely the first step an individual can take lies in self-development—expanding one's horizons and building on one's existing abilities.

Solving problems today takes "innovation," Glaser said. But innovation is "disruptive—it hurts!" and it changes everything we do, he noted.

It takes a strong individual to cope with human behavior that says "let us espouse it (innovation), praise it, do anything but do it," Glaser said.

## Glaser Sees DPMA Enhancing Future of NCC

(Continued from Page 1)

launch a project that would eventually lead to an AFIPS position statement on certification and licensing.

And he indicated the time has come for the federation to decide just how strong a participant it wants to be.

"It's very unfortunate the federation hasn't yet come out with a statement on issues like certification and licensing," Glaser said. "I am disappointed we have not made more progress in this particular area and attribute much of the reason for our inaction to the care we must take not to step on the toes of our constituent societies."

While noting that one of AFIPS' primary functions is "to act on behalf of its constituent societies and their more than 100,000 members on matters of broad importance to the information processing community," he indicated the federation is "a bit timid" as a result of constantly reacting to constituent societies' needs and desires.

"Personally, I believe AFIPS should be a strong federation," Glaser said. He added, however, that much of the conflict board members face in attempting to decide between collective "AFIPS" action and action by each of the individual societies it represents is both "tough and healthy."

In commenting on some of the research efforts of the federation, he commended the work put into the AFIPS manual for securing computer systems and its job analysis for computer programmers.

"We shrank our effort to actually certify systems after coming to the conclusion that we didn't know how to do that," he said. A similar approach was taken with the programmer analysis because there is "no clear unanimity of opinion on what computer programmers



"It's very unfortunate the federation hasn't come out with a statement on issues like certification and licensing..." Glaser said. "I attribute much of the reason for our inaction to the care we must take not to step on the toes of our constituent societies."

should know and do."

Glaser recognized that NCC "is the most viable product of AFIPS," commenting that he felt the conference "has been extremely successful in permitting technical developments to be revealed—and enshrined."

He added, however, that he would like to see an increased public awareness of other services provided by the federation such as the AFIPS Press and its free brochure detailing its offerings of pamphlets, manuals and books.

Praising the dedication of the people with whom he has worked at AFIPS, Glaser concluded that such a federation holds great potential for cutting across the broad set of computer interests existing on a national level.

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## Minicomputers Take First Place In CW Poll on Reader Interest

(Continued from Page 1)

options, such as all-digital nets and satellite services, at 11.

This seemed to indicate that, while DP personnel are concerned about the immediate problems in the communications field that may enable them to both save money and increase the efficiency of their operations, there is little interest in the communications area itself as far as their own or future developments are concerned.

Vendor support and enhancement of operating systems received a surprisingly high average of 4. This probably derived from the same reasoning that ranked batch to on-line third — DP personnel are currently most interested in ways to increase the efficiency and monetary savings of their present operations.

The movement toward distributed processing ranked fifth overall and probably owed its high rating to the association many DP people make between it and minicomputers.

It was of especially high interest to those who checked "other" as their job definition, a category dominated by educators and those involved in the computer industry itself. This group placed distributed processing second in their list of interests.

The only category involving IBM that ranked in the top half of reader interests was future IBM products after the 370 line, which was sixth. The government's antitrust suit against IBM received little interest at 12 and, as mentioned above, IBM's entry into satellites struck out completely.

Even the small amount of interest in future IBM products was primarily from the "management" and "other" sectors of the industry.

Standards for programming languages held the middle ground with a rating of 7, a result fairly consistent with all the individual categories except programmer/analysts. This group ranked language standards first and, because of their high interest, standards received the second largest number of responses overall.

Budget reductions, "professionalism" and the licensing of computer people and possible privacy regulations on private data banks had averages less than a fraction apart, ranking 8, 9 and 10 respectively. Licensing, however, did receive a large number of comments from people

## Maryland Senate Kills Price-Marking Bill

ANNAPOLIS, Md. — The Maryland bill which would require supermarkets to mark prices on all items, even those containing the Universal Product Code [CW, Jan. 22], has died in a state senate committee.

A similar measure, however, has passed the Illinois house and has a good chance of enactment, according to Rep. Richard F. Kelly Jr. (D-Hazel Crest).

The Maryland bill died when Senate Economic Affairs Committee Chairman Harry McGurk decided not to bring it up for a vote, according to Ellen Haas, president of the Maryland Citizen's Consumer Council.

Six of the nine committee members had said they were in favor of the bill, she added. McGurk was unavailable for comment.

Kelly said the aim of the Illinois bill is to protect the consumer who wants to compare food prices and to save "thousands of jobs for retail clerks in Illinois that would be eliminated if this system is implemented."

"This is a most inappropriate time to increase the unemployment in our state," he said.

claiming it was not an issue, while others favored marking it 999 on their list of interests or a valuation thereof.

Although privacy only ranked 10, this is an improvement from three years ago, when it probably wouldn't have been considered an issue. This could indicate the computer industry's growing awareness of its responsibility to the public as well as the business world.

But the other issue dealing with public concerns — the consumer problems created by electronic funds transfer systems (EFTS) and the Universal Product Code (UPC) — ranked very low at 13.

These rankings were based on total responses only. When broken down by occupation, some interesting discrepancies appeared between the four groups, and they will be discussed next week.

## Going Once, Going Twice...

BOSTON — A \$15,000 Digital Equipment Corp. small business system will be going under the gavel at this year's Channel 2 auction here.

The DEC Datasystem 310 will be right in there with the antiques, 30-lb bags of jelly beans and autographed hockey sticks hawked at the week-long televised event, which raises money for WGBH-TV, an educational television station here.

The DEC machine, the largest single donation in the auction's history, will be put through its paces each night during the May 30 to June 7 event. It will be sold to the highest bidder on the final night.

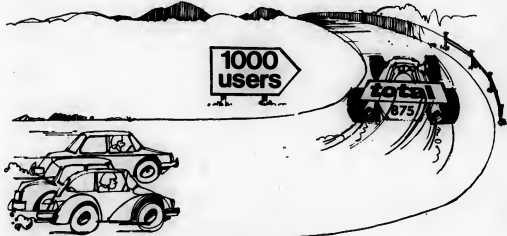
The buyer will own a system built around a 16K DEC PDP-8A processor; a VT-50 CRT with cursor control and numeric keypad; a floppy disk drive with 670K characters of storage; and an LA36 read-only 30 char/sec printer.

The package also includes the DEC COS 310 operating system and three weeks of training for a buyer's staff member.

In addition, DEC will provide installation, three months of hardware warranty and the privileges due any DEC user, according to Lee Katz, promotion supervisor for the firm's Business Products Group.

The auction may be a chance for a user to pick up a 310 at a bargain price, he said, but added he hoped buyers would view the auction as a chance to make a tax-deductible contribution to the television station.

M.I. Systems, Inc., a consulting and custom systems house that specializes in mini- and microcomputer applications and interfaces, will be donating about \$250 worth of its time for bid, according to Barry Milberg, the firm's president.



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# Personalized DP Diets Wage Battle of the Bulge

By Catherine Armat

Or the CW Staff

Stillman, Atkins, Weight Watchers, jogging—these are some of the more famous methods used to shed pounds by the 60 million Americans adults who are more than 20% overweight.

Last year, some \$12 billion was spent in this country on goods and services designed to wage war on fat. Some companies are trying to cash in on this market with the weapon of modern technology—computers.

Computers have been used for some time in aiding menu and diet planning at hospitals, but a few commercial companies have taken the practice a step further by marketing computerized diets for the general public. The idea is to help the weight-conscious consumer slim down with his own personalized diet.

Two companies in this market are Nutritional Diet, Inc. of New York City and Time Pattern Research, Inc. of New Jersey. Both use the same method: a dieter fills out a questionnaire that is

fed into a computer programmed to print out a menu specifically tailored to that person's needs.

Nutritional Diet asks 50 questions concerning weight, height, age and the dieter's likes and dislikes in food. From the answers, fed into an IBM 360/40, menus are drawn up for 30 days, each including a breakfast, lunch, dinner and snack.

Joel Green of Nutritional Diet said every menu plan is different and includes how much as well as what kinds of food to eat.

The diet is both weight reducing and fully nutritional, he claimed, and he feels its attraction is that a dieter eats only foods he likes, and the meals are full enough so the dieter won't feel hungry.

## 'Chance to Make Money'

The company came out with a computer diet because "it was a great chance to make money," according to Green. It bought the basic diet plan three years ago and spent about a year adapting it to the computer and making it more palatable. It's marketed

through mail or direct mail, is available nationwide and costs \$2.95.

Green said the diet has been successful and, although it may seem faddish, he personally would attest to its value. "I lost 50 pounds over 3-1/2 months, and a number of my friends lost almost as much."

Adkins Computerized Diet marketed by Time Pattern Research is similar to Nutritional Diet and was designed by Dr. Georgia Faludi, director of the Obesity and Diabetics Clinic at Hahnemann Medical College and Hospital in Philadelphia.

Through her experience in the nutrition field, Faludi found most available diets are not reasonably sound because they are so broad. The best diet is designed personally for the individual through working with a doctor. Or, as she put it, "You can't have one pair of shoes for every pair of feet."

However, the cost of such a method is often prohibitive and impractical for those without access to an obesity specialist. Faludi's solution was to work in conjunction with Time Pattern Research, a company already marketing computerized astrology and biorhythm charts, to duplicate as closely as possible the technique of designing a diet plan through a personal interview.

The result was a form asking 38 questions and listing 200 food items which could be marked as to preference.

Bernard Gittensohn of Time Pattern said his company decided to develop Cadence because of the tremendous interest in dieting in this country. What was needed, he felt, was a sensible way to take off weight and keep it off that uses no unusual foods, is not dependent on exercise and doesn't present a danger to the dieter.

The firm rejects any applicants who should be under a doctor's care or for whom they can't design a nutritionally balanced diet, about 10%. They also offer a money-back guarantee if not satisfied.

## 21-Day Menu Plan

The questionnaire is run through an IBM 370/145, which prints out a 21-day menu plan. Besides including the types of food, the diet lists the amount and is also designed around individual eating habits, whether it's large meals or light snacking.

The diet is basically balanced meals, Faludi said, and attempts a relatively slow loss of weight (about two pounds per week), which she feels is the safest method. There is no need to count calories; if a dieter follows the meal plan, he should lose weight as he adds.

Cadence has been available since January 1974 at a cost of \$15. Gittensohn claimed about 10,000 plans have been sold so far. The company is currently working on a follow-up to be used after an ideal weight has been reached in order to maintain it.

Faludi believes the best diet of all is still "simple willpower." But in a country of chronic overeaters and underexercisers, computers are possibly one method for fighting that.

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May 29-30 Cleveland

June 19-20 Washington, D.C.

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Programming

July 14-18 Washington, D.C.

Advanced Structured Programming

May 15-16 San Francisco

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June 16-18 Washington, D.C.

Structured Design/

Programming Workshop

June 2-6 Columbus, Ohio

July 14-18 Boston

How To Teach Structured Cobol

July 24-25 Washington, D.C.

Rational Fortran

June 19-20 New York City

Structured Testing

July 17-18 Chicago

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June 25-27 San Francisco

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July 14-15 Washington, D.C.

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## Editorials

### An All-IBM Capability?

When an IBM product director talked about the need for multiple interrelated processors at the recent Interface '75 conference, data communications users were listening.

Up to now, the real champions of multiprocessor networks have been the minis. They had the advantage over the larger mainframe vendors in they had lower cost equipment. The lacking expertise had been in the area of network systems support in which the mini vendors were traditionally weak.

IBM had been edging into the total teleprocessing domain for some time, first with its specialized industry-oriented terminal systems. Then it announced its Synchronous Data Link Control (SDLC) protocol designed for higher speed full-duplex networks including satellites and digital networks. And finally it announced its intention of becoming a satellite carrier.

IBM also outlined a master teleprocessing environment based on a combination of SDLC together with its Virtual Telecommunications Access Method (VTAM) and the Network Control Program (NCP). The overall grand design was called System Network Architecture (SNA).

Since the first basic announcements, there has been precious little detail about the SNA environment. There have been a few preliminary implementations of SDLC amid reports that much of the SNA design concepts were not yet operational.

It is now obvious terminal-based systems connected with SNA common control are very much a part of the configurations being charted for tomorrow's user by IBM. The entire package will provide the user with impressive DP power at the farthest points of its corporate network. It is also obvious some of the network control now in the hands of the user will revert to IBM through its remote maintenance concepts.

If IBM is really serious about generalized networking concepts that will allow any terminal in a network to talk to any processor in the network, it will have to provide a combined hardware, software and transmission capability to the user. It is still to be determined where the dividing line between data processing and communications facilities exists in such a total network.

Meanwhile, users planning their data communications networks will have to decide whether an all-IBM computer/communications capability is what they really want.

### Before the Crash

The nation's developing automated air traffic control system should be closely scrutinized by Congress to determine whether recent charges claiming it is unsafe are true.

The undertaking needs careful study because the consequences of an uncorrected bug are potentially fatal on a massive scale.

The system should not be used until the extent of the problems can be discovered and corrected—or until the reports of the bugs are proven unfounded. The flying public deserves the protection that would be afforded by such a study and it should begin before a major accident makes it mandatory.



"Bug or Two Still in the System, I Guess..."

## Letters to the Editor

### Universal Communications Net Not Planned by IBM, Cary Says

The editorial headlined, "Remote Maintenance Appeals" (CW, April 21) referred to "industry experts who see the IBM domestic satellite plan as only one point in a universal IBM communications system."

I don't know who the experts are, but I can assure you they are wrong.

Also, I was particularly amused by the phrase, IBM "has only [emphasis added] to convince the appropriate postal telephone and telegraph agencies that it should become the keeper of the satellite communications..."

Even an elementary knowledge of the telecommunications policies of the various European countries should tell you that is unrealistic.

Frank T. Cary  
Chairman of the Board

IBM  
Armonk, N.Y.

### Proven, Non-IBM Systems Abound

It is a credit to a publication when it is impartial enough to publish totally biased and obviously unsolicited opinions in the name of free press. However, after reading G.H. Barger's letter (April 23), I felt compelled to reply with some facts.

Contrary to Barger's belief that only IBM has "thousands of successful systems," NCR, as one example, has over 5,000 Centurions and over 8,000 399 computers successfully installed. The fact that these are satisfied customers has been ascertained by Datapro in an independent study.

I assume Barger is in a position to make a choice in equipment. I sympathize with his employer, as it is obvious that Barger, unable to analyze his business's requirements, allowed sheer numbers to influence his decision.

Had he looked beyond his own prejudices, Barger would have found there are other manufacturers that have comparable proven systems with excellent and often free support at a considerable savings to his employer.

But then Barger isn't paying the bill, is he?

Leonard LaFrance

Walnut Creek, Calif.

### Manager in a Special Category

If Computerworld gave a prize for the most minuscule letters it received, G.H. Barger would win hands down.

The marketing people for non-IBM companies have for 20 years known about the many prejudiced, stupid, self-centered empire builders that call themselves "IBM managers." However, until

now, very few would admit it, especially in writing.

With most people in Barger's category, the salesman had to watch for clues like "I am not married to IBM" or "I have an open mind." The dead giveaway was when he answered his phone, "IBM Department."

Over the past years, I have encountered fewer people like Barger, but it's nice to know a few "IBM managers" still exist. Notice I did not call them "DP managers."

I ask just one thing of Barger, since at least he is honest: that he show his letter to the president and sales manager of the company that hands him his paycheck.

Good luck in finding a new employer!

Ed McDermott

Cleveland, Ohio

### Only 15%, Not 28%, With Lord

So Kennation W. Lord Jr. must have had the last word (CW, April 23). He's impressed with his 28%. Let him be.

His psychology is appalling and no doubt will attract some of the nonthinking "secondary and tertiary readers..."

However, his letter reminds me of a little boy who lost and then wants to play for two best of three, then four out of seven, then... where does it end? It reminds me of the politician who lost and demands a recount. It also reminds me of "if you tell them often enough and loud..." And lastly it reminds me of the many minority groups who are obtaining their goals because the majority is afraid to take a stand for fear of being tagged as ignorant, without guilt, without charity, without justice, etc., even when the majority is right.

Hogwash and double hogwash! He doesn't scare me with his trumped statistics and licensing pursuit threats/innuendoes.

Jesus said, "He that is not with me is against me..." (Matt. 12:30), so parallel truth reduces his percentage to 15% because CW (April 23) reported 13% didn't vote on licensing.

This subject of licensing has the all-too-familiar aroma of other airline innuendoes for the public's protection. The last stretch is still lingering—remember how the previous administration protected us with "national security?"

The vomit still comes out power and greed under the guise of the public's welfare and professionalism.

Waterford, Pa.

Karl G. Gordon

(Other letters on Pages 11 and 14.)

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.



## Letters to the Editor

### Fortran an Overkill; Good Languages Exist

It is good to see a programming language has been developed especially to simplify structured programming ["Staple" Backs Structured Tests," CW, April 9]. Fortran, however, does not seem to be the appropriate base language. For one thing, it is about as unstructured as you can get.

Even though Staple was developed "by utilizing conventional Fortran syntax," Fortran barely has a syntax at all.

Isn't it overkill to develop a structured language when there are several already that are very good, such as Algol 60 and especially Algol 68? Paul Koning  
Appleton, Wis.

### 'Isn't IT Wonderful'

In reference to Thomas Shaffer's letter promoting an "English-like" IT statement [CW, April 9], programming is a discipline which requires logical organization with specific references. The overuse of pronouns

and vague phrases causes many communications problems with English.

IT is used as IT is usually used, it can lead to many problems. IT's also has its merits as well. IT's faults. IT can save time if IT is what you want. In this age of mediocrity, IT is wonderful to see IT do what is expected of IT - whatever IT is! IT can be the least hardware of a whole new school of ambiguity in programming! Some day we may "whachamacallit" our "things until we are forced to" "END" "IT" "ANYWAY."

Allen F. Memby  
Somerville, N.J.

### Software for an I130

In response to Jean-Jacques Reul's letter [CW, April 9] the best tape software for IBM I130 machines is furnished by Brown University in Providence, R.I. Contact: William Skokdo. This assumes tape drives have been furnished by IBM.

For packaged software such as sort programs, we have generally found DNA Systems in Flint, Mich. has a wide selection.

L. F. Wygant  
Chicago, Ill.

...Nor all your Piety nor Wit  
Shall lure it back to cancel half a Line,  
Nor all your Tears wash out a Word of It.  
Word has come of the untimely death of Stan Gill, one of the great world figures of software and one of the best loved of British computer pioneers. In spite of almost 30 years in our field, Stan was only 49. He died in splendid good health at his flat in '74 in Stockholm, where I saw him last, and the ugly news was therefore doubly unexpected.

Stan was the least hardware-oriented of the three authors of the first hardcover book on programming: Wilkes, Wheeler and Gill, written in 1950. I had met Maurice Wilkes by then, and Dave Wheeler had been at Illinois working on the "good" Illiac, but he was not at that time Stan. How vividly I remember the small group of what we would today call systems programmers at IBM Poughkeepsie, writing the operations manual for the Defense Calculator (later the 701, around which Share was organized), passing the slim brown book around and discussing the then-novel subroutine entry technique! That group included Nat Rochester, Werner Burzio, Bill McClelland - and me, as a sort of simulated customer.

Later, when I went to England in 1954, I met Stan for the first time. He was easy to know; warm, friendly, informal. He went from Wilks' shop in Cambridge to Farranti in Manchester, and there helped

both the hardware and software people with the multiprocessing, multiaccess and read-only-memory concepts under development.

We became good friends during this period, and the friendship continued when he went back to university life. He was a founder and a president of the British Computer Society, an adviser and consultant to government agencies, and a very respected international figure. But I remember him best as a man, not as a famous computer expert. I remember his sympathy for younger people, his quiet humor, the little favors he did for me and for many others.

He had friends, admirers, disciples from Australia to Zambia. He influenced the software business strongly for 20 years. He believed in the computer and in what it could do for Britain and for the world. He will be missed.



Heb Gronk

## Doctors Shift Billing Problems Onto Service Bureaus

One of the most well-supported of DP services is in the medical billing area - particularly in direct billing. Nowadays, billing of medical services, particularly insured or semi-insured ones, is one of the most complicated messes in modern technology.

has produced and one which has spawned many complaints about computer arrogance. The major problem is a result of the apparent inability of the system designers to realize that a bill which may not need to be paid really isn't a bill at all - no matter what it says regarding balance due.

### The Taylor Report

By Alan Taylor, CDP



Instead, it is an irritation and worry. People that get these bills get a poor image of the doctor(s) concerned and his apparent unthinking materialism. So, it is no service to the doctor-patient relationship. Into the bargain, it can easily be put to one side once too often and so, hurt the cash flow as well as the relationship.

Both of these facts should be - but don't appear to be - taken too seriously by the system designers.

### Please Disregard

Figure shows some of the problems that can occur on a first bill. This bill is included in an envelope with a note saying "We are on an automatic billing system... If you have provided us with the proper forms, please disregard any bills you may receive from our computer..." until your insurance company notifies you they have made

payment."

This is all fine and dandy, but it leaves one in the dark about whether the doctors have in fact got the proper forms, have made a claim, etc.

Moreso, this notation is not on the bill itself and can be easily mislaid. The bill is poorly designed in some ways.

- If used as directed, the patient would lose:
- The reference number.
- The doctor's names, which he probably knows.
- The telephone number and extension.
- The billing date.

None of these are unimportant to a properly kept set of records. All in all, this is not a job that either the doctors or the service bureau have reason to be proud of. Noticeably, the service bureau does not put its own name anywhere on the bill.

### Balance Due

Figure 2 shows another later version of the same problem, from a different set of doctors who don't even have their individual names showing. Here the stub design is much better than in Figure 1 - but the designer has apparently forgotten that the patient and the person responsible for the bill may not be the same person. The policyholder's name does not appear at all.

Here the biggest legend is "balance due," although, quite obviously, payment of the amount claimed as due would be proper only if the doctor had either established a right to bill both the patient and the insurance company or had ordered the insurance company to pay the patient's bill.

Neither of these situations appears to be the case, from the constantly repeating (and, therefore, spacewasting) comment,

"Our office has filed a claim for the above, with your insurance company."

What makes this effort particularly onerous is some form of an automatic dunning device which starts on March 19 to send computer "nastigrams" to the patient (not to the policy holder).

Letters to the doctor about this have not stopped later ones and Robert Hengen (Oh yes, they spelled the name wrong, too) is just waiting for the standard runaround he has received since he was one of the first computer programmers in Eckert's and Mauchly's day!

The question Bob poses is whether a system designer or a service that specializes in putting out these direct bills should permit the doctors to fail to give them the necessary information to do the job properly.

Certainly, neither of these specimens really takes into account the needs of the insurance policy holder or the patient although system design could easily do so.

Bob thinks, and I agree with him, that there is one professed, which has dumped its problems right into our lap - and we are getting a bad name because of our failure to do a little more, and to have a little better systems design.

No wonder there is a call for licensing, when we have no way of pulling our own standards up in such basic areas as billing.

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FIGURE 1: A medical bill from "PROFESSIONAL ANESTHESIA" dated 4/15/75. The bill is for \$100.00. It includes a note from the doctor's office stating that the patient is on an automatic billing system and that the bill should be disregarded if the insurance company has been notified. The bill is addressed to the patient's home.

Figure 1. This bill is accompanied by a note inviting you to ignore it if you have supplied proper insurance information to the doctor - but there is no flag on the bill to say that they have actually filed a claim or that they have all the information to do so. What good is a bill if it is known not to be due? (Or is the service bureau simply increasing its business by not suppressing bills of this nature).

FIGURE 2: A medical bill from "PROFESSIONAL ANESTHESIA" dated 4/15/75. The bill is for \$100.00. It includes a note from the doctor's office stating that the patient is on an automatic billing system and that the bill should be disregarded if the insurance company has been notified. The bill is addressed to the patient's home.

Figure 2. This bill was followed up by computerized nastigrams letter addressed to the wife of the policy holder. Letter complains and requests for information failed to stop the automated letter series - a waste of postage and irritation all around. Again, no inclusion in the system that the bill should not be sent out as a bill until it is really totally due - and that does not yet appear to be true.

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The V-75 widens the competitive gap even further with the Writable Control Store package. New firmware modules include byte and stack manipulation and accelerated FORTRAN functions.

The new, fast FORTRAN included in the V-75 package is comparable to large machine compilers. With double precision integer data, compiler overlays, seven dimensional arrays, and direct access I/O.

The V-75 leaves the competition behind. Eclipsing Eclipse. The PDP 11/70. And everything else around.

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## Letters to the Editor

### Sight-Checking Must Bow To Practicalities of Job

In the April 23 Taylor Report, Gerald Salton blamed the system for an undesirable W-2 form that ended up in a drawer at the post office.

A system is only as good as its weakest link, and it was apparently a clerical function to analyze returned W-2s in this particular case. No mention was made of any other W-2s in the drawer. If only one W-2 was there, I would say it should not be used as a method to analyze errors.

There was one statement with which I disagree: "The computer system has replaced thinking clerks with unthinking keypunchers."

If keypunchers work in an environment where they enter a variety of jobs, they have to be thinking all the time. True, you can enter a person's last name for a street, but this shouldn't be classified as "unthinking."

If operators were required to sight-check everything they entered, we'd all still be waiting for W-2s.

Ronald A. LaForce

Cleveland, Ohio

### Don't Hang Up

In response to the letter from Michael P. Eisenman headlined "Honeywell User Feeling Ignored" (CW, April 23), I would like to present another viewpoint.

We at Carl E. Woodward, Inc. have just signed a five-year lease for Honeywell's newest machine in the 60 series, and by no means are we a large corporation—less than 200 are on our weekly payroll.

As a recent graduate in computer science, it has been my duty to provide management with a viable solution to our current DP and accounting problems. The only road to solving these problems is the growth of communications.

Just as I must constantly communicate with the company president to find out exactly what he is looking for in terms of information, Eisenman's DP manager must also communicate with him. To provide this information, I reviewed 16 different computer vendors and selected the Honeywell people—because of the machine capabilities and because of the response I received from all my inquiries.

Honeywell did not "suck [Eisenman] into an extended lease." He signed the contract. If he feels slighted or ignored, let Honeywell know directly.

If Eisenman hangs up on his end, he is just as much to blame as Honeywell.

Michael R. LaCardner

DP Manager

Carl E. Woodward, Inc.  
New Orleans, La.

### Source of the Action

I have been reading *Computerworld* for six months now in the hopes of seeing some articles relating to small retail businesses and computer use.

We have two stores and I know there are thousands of others who are in our position, watching for articles that show the use of cash register point-of-sale computer information for one to four small store operations.

It seems so funny to see the ads in CW for big companies that have all kinds of computer terminals—except those attached to a computer register—and baby, that's where the action is in moving goods and services.

Carl Rickson

Rickson's Shoes

Evansville, Ind.

### Superman Not Real

After reading the statements of Kenneth W. Lord Jr., president of the Society of Certified Data Processors (SCDP),

"Lord Defends Licensing as Matter of Conscience," CW, April 23], Lord makes about as much sense as a rubber crutch.

If all Lord is worried about is the consumer's well-being, he should start a computer group and get specific. Superman is not real and there is nobody that can be great in every area of DP (great managers are not always great systems people).

I do not believe in licensing—all it will do is create another data base file of names and addresses. Those in the business that are great will be recognized without a license.

Let's work on educating upper management in DP, since it is creating audit systems for the upper management and auditors to use in place of licenses.

John W. Larson

Stirling, Colo.

## TASK/MASTER the standard of excellence in telecommunications monitors

### ease of installation

TASK/MASTER can be generated and operational in hours. Simplified specification of the operating system to be used, programming languages, terminal support required, and system options insure a smooth and easy initial installation. Expert TSI personnel train your staff on-site and guarantee a rapid successful system implementation.

In a recent survey of ninety telecommunications monitor users TASK/MASTER ranked ahead of CICS, ENVIRON/1, and INTERCOMM in ease of installation.

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TASK/MASTER allows direct and simple interfaces from COBOL, PL/I, FORTRAN, and Assembler applications. Application programmers can be trained to write efficient on-line programs in hours. Any level of IBM compiler can be used, without modification. Unlike CICS, no pre-processing of high-level language programs is required, further simplifying application creation, testing, and maintenance.

Not unexpectedly, in a recent user survey nearly two times as many INTERCOMM users and three times as many CICS users felt their system restricted the application programmer as did TASK/MASTER users.

### resource management

TASK/MASTER's basic architecture and technical facilities allow significant resource savings. Survey after survey and installation after installation have shown that TASK/MASTER can be generated to run in 10%-50% less storage (including real storage required in a virtual environment) for any specific user requirement than can any competitive approach.

TASK/MASTER also saves on other system resources, including CPU overhead, disk space, and master terminal costs.

### features

TASK/MASTER provides features totally unmatched in any competitive package. Among these are:

- a complete message queuing mechanism, including automatic disk overflow, station-by-station control, queue protection, and duplicate message suppression in the event of system failure and restart
- true terminal independence which makes device control characteristics transparent to application programs and is far more powerful and easier to use than any other message mapping facility
- file protection allowing automatic recreation of databases after system or file loss
- a general interface to any database management system, including TOTAL, QUL, ADABAS, DB/2, IMS, and others
- automatic application restart in the event of a system failure without duplicate file updating due to message reprocessing
- terminal support which covers the widest choice of IBM and non-IBM devices in the industry

### vendor support

TSI's support for TASK/MASTER users is the best in the industry. Once again using the DATAPRO survey as a reference monitor users rank our support for TASK/MASTER well ahead of CICS, INTERCOMM, and ENVIRON/1.

In an independent users study approximately 85% of TASK/MASTER users felt the technical support provided with the package was good versus less than 65% of the INTERCOMM users and only half the CICS users. Why? Possibly because of the four vendors involved, we are committed exclusively to excellence in on-line systems and have built a Customer Service organization committed to that single goal.

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Although the other advantages on this page translate into cost savings many times the price of the monitor itself, TASK/MASTER is also the lowest cost package on an out-of-pocket basis. TASK/MASTER's low price includes all installation support and education services.

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Whether your environment — DOS, DOS/V, OS, or OS/VS — TASK/MASTER will perform better than any alternative you could choose.

Surveys have consistently placed TASK/MASTER at the head of the field in overall system performance considerations. In a VS environment, TASK/MASTER has over two years of demonstrated capabilities running in a fully virtual mode, an unmatched record with equally unmatched results in scores of VS shops.

### user satisfaction


In the final analysis the overall satisfaction of existing users is probably the most critical factor in selecting a monitor. In survey after survey TASK/MASTER users have expressed the highest level of satisfaction with their system. DATAPRO's results were once again typical: when compared against the other monitors on the basis of overall satisfaction TASK/MASTER came out ahead of the field by a significant margin.

In 175 installations around the world, TASK/MASTER is establishing new standards for simplicity of use, reliability, performance, and user acceptance. Any or all of these are our best advertisement.

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# The Hewlett-Packard 3000 is a minicomputer?

“**The 3000 a minicomputer? I think calling the 3000 a mini is an abomination!**”

When we asked Mr. Thomas Harbron, Director of the Computing Center, Anderson College, Anderson, Indiana, what he thought about the HP 3000, he had some very interesting things to say:

“We’re using the 3000 for administrative processing, academic work and some commercial work. We have 27 terminals and we selected the 3000 because we wanted a system that would provide us with remote access and would do general purpose types of things from the terminals. The 3000 allows us to do many different things at different terminals. In fact, it does everything we expected it to do and was the only machine we could find in its price class that would. I’d recommend the 3000 to others. It’s a powerful and versatile machine. And it’s cost effective as well. It’s half the price of anything that comes close to it.”

“**I don’t think that Hewlett-Packard ought to call the 3000 a minicomputer. It is a complete medium-sized system.**”

That’s what the EDP center manager of an aircraft manufacturer said about the 3000. He also had this to say:

“One primary reason we bought the 3000 was to collect and analyze radar development data. The problem is that we have to collect data fast enough, pipe it to a computer, analyze it,

and then make the necessary instrument adjustments. HP’s 3000CX was the answer. We also bought it for its interactive capability. Very significantly, in our acoustics department we had to have the ability to turn around data analysis fast. The 3000 has been a real cost saving computer for us. For the last two years I was the entire staff for the 3000. Not a great deal of detailed knowledge of the system is necessary. Technicians can use it without much training. I’m very much sold on the 3000. And it’s definitely a complete system—not a minicomputer.”

“**It allowed us to run eight times the volume at a third the cost. No minicomputer could do that!**”

The above statement was made by the corporate banking division EDP manager of a major California bank. He also said:

“We’ve had the 3000 for over nine months. A year ago we were on a time-sharing system and the cost became prohibitive. We contacted six different companies to look over and bid on a proposal that defined our needs. HP was the only one that could handle our total application of management information for the Corporate Banking Division. The 3000 is not just a mini—it’s much more. We’re constantly amazing people here with what we can do. It’s not hard to operate, not hard to cope with. But our favorite topic is that we’re paying less than one third of what we were paying and running four times the volume. And this year, we’ll double our volume again. That’s eight times greater and less than one third the cost.

That’s really productivity!”

**“We found the only thing mini about the 3000 was its price.”**

When we asked the EDP center manager of another major manufacturing company about the 3000, that was what he had to say. He also had this to say:

“Our computer needs include both scientific and commercial applications. We were phasing out our teleprocessing terminal and our Environmental Monitoring Division's computer. So we started looking. We spent several months studying computer systems, and rated them on speed, versatility and ease of operation. The result of our study showed that the HP 3000 provided these requirements and had the best cost/performance ratio. We didn't fully realize the potential of the 3000 until we started programming it. We have experienced a significant cost savings in the seven months we've had the 3000 and we expect a greater savings in the months ahead. We really like the interactive CRT for programming and data input. Being a multi-programming system we can have many users on at the same time. The power and speed of the 3000 is equal to a large machine. It's no mini. Calling it the Mini DataCenter is more accurate. I'd definitely recommend the 3000 to other potential users. In fact, we already have. We feel they would be money ahead.”

**We're glad these and other users of the HP 3000CX set us straight.** We called it a mini-computer because its state-of-the-art technology lets us sell it for a minicomputer price. From now on we'll call it a Mini DataCenter.

**We want you to get the whole story.** Write us for your copy of our HP 3000CX Mini DataCenter booklet. We know you'll find it interesting, informative, and maybe a bit surprising.

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## Letters to the Editor

### Bug-Free Applications Only 'Incredible Self-Deletion'

Although *Computerworld* gave front-page prominence to the story about microprocessors and "grand scale integration" ("Microprocessor Revolution Seen Altering Traditional DP Center," CW, April 16), I find it difficult to believe that either CW or the author of the story can be aware of the state of the art of programming.

To judge from the behavior of the people who use the computer in my Computing Services Center, as well as the remarks made by my own programming staff, even the writing of 20 lines of bug-free code is regarded as a miracle.

Nearly everything these people do is counterproductive, that is, it hinders their ability to produce bug-free code.

To imagine the advent of another "advance" in hardware technology portends the arrival of an ability to hardware bug-free application programs is the most incredible kind of self-deletion I have encountered in recent years.

Robert M. Gordon  
Director

Computing Services Center  
Victoria University of Wellington  
Wellington, New Zealand

### Ordinance With an Impact

I was interested to read the April 2 editorial praising the Association of Data Processing Service Organization's (Adapso) proposal for requiring a privacy impact statement before any new government data system is implemented. The city of Berkeley has just such a law

(Ordinance 4732-NS). It requires that, before any money is spent beyond the preliminary design stage on a city-run system which includes data on identifiable individuals, a social impact statement must be prepared and adopted. It is my hope that this ordinance will serve as a model, or at least a stimulus, to similar legislation at the local, state and federal level. Anyone who wants a copy of the ordinance can obtain it without charge from the office of the city clerk.

Ronald K. Sipherd

Berkeley, Calif.

### No Such Suggestion

In the article by Gordon D. Hutchison which appeared in the March 19 issue, the author reported that "the Canadian computer industry is sufficiently opposed to a new set of terms issued by the federal government that they may collectively refuse to sell to the government."

The Canadian Business Equipment Manufacturers Association (Cbema) has been discussing standard terms and conditions with the Department of Supply and Services since early 1972.

While Cbema objected to several of the terms included in that document, there has been no suggestion the members of Cbema may collectively refuse to sell to the government upon those terms.

The members of our association are individually dealing with each procurement. In the meantime, our association is continuing to make representations to the government concerning those aspects of DSS 9020-A which are objectionable.

G.D. Wynd  
General Manager

Cbema  
Rexdale, Ontario

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**"With a Little Help From..."**

## TVA Tunes 360/50 Operations, Then Goes to RJE 30

By Don Leavitt  
of the CW staff  
CHATTANOOGA, Tenn. — The systems programming staff of the Tennessee Valley Authority (TVA) has spent the past two years becoming aware of the potential value of computer performance evaluation (CPE) and applying some CPE techniques — with impressive results.

But "we haven't gotten too far down the road yet," according to staff manager Kathryn K. Hicks.

"Down the road" or not, Hicks' crew has learned to keep its eyes and ears open "at all sorts of evaluation meetings." Though she wasn't able to dedicate one of her staff to CPE, Hicks has followed a pragmatic approach — "Let's outline a plan and see what we can do with what we've got."

One of the things she does have is a good working relationship with the Federal DP Evaluation and Simulation Center (Fedsim), which was called in two years ago to study the TVA situation. The authority had just recently installed an IBM 370/165, but had most of its workload on a 512K 360/50.

Hicks didn't think the 50 was saturated, but she "had a feeling it wasn't doing what we ought to be doing. We just weren't getting out of it what we ought to have gotten."

And so Fedsim was asked to study the 50, suggest changes and help TVA to become self-sufficient in evaluation.

Fedsim analyst Don Deese made the original study, including a month of hardware monitoring and analysis, but, as he noted, recently, TVA was already doing things to help itself. Most of the workload was being shifted to the 165 and so the strains were lessening.

But the study highlighted some areas of concern, and Hicks and Deese went to work on them. There was a good indication, for example, that the 50 wasn't maintaining a satisfactory level of multi-programming even though it was under OS/MVT.

They also began to recognize user organizations that were having an especially heavy impact on the system resources, and they used some of their software tools to see if those programs couldn't be made more efficient.

### Dicks III-Used

The study also showed disks were not being used effectively. For the most part, they were organized into sequential files and being used as if they were the tape drives with which the applications programmers were familiar.

Deese recommended additional training for the operators so they would have a better understanding of the possibilities of OS/MVT multiprogramming. Use of

IBM 2314 disk drives and more modern access methods helped in the peripherals area, and reworking the Job Control Language (JCL) of some programs also improved their performance.

In one program, Deese recalled, a two-card JCL change meant an annual savings to the end user of \$50,000 in computer time.

In any event, the overall impact of all the first efforts was a cutback in the schedule on the 50 from three shifts on seven days a week to two shifts on five days a week.

Since then, the shift of work to the 165, located here, has continued and the 50, once in Knoxville, has been completely

replaced by a 360/30 then used as a remote job entry (RJE) workstation feeding into the 165.

Some of the 2311 disk drives originally hooked to the 50 are still in TVA service, but they're now tied to the 165, enhancing the resources available to that system, Hicks noted.

Fedsim and TVA have continued an informal exchange — "mostly letters and phone calls" — since the original study was completed, and Hicks feels her staff has reached the "medium level of expertise" in CPE work that she set as a goal in one of her letters to Deese.

But the 165 is beginning to show the results of some of the tuning and some of

the inevitable growth in workload that comes to any large system. TVA is getting deeply involved in time-sharing, with 10 terminals now running under IBM's Time-sharing Option (TSO) and another 20 expected by the end of the year.

The RJE work from the 30 in Knoxville and implementation of a data base management system, planned to start later this year, will take their toll, too. So, in September, Fedsim will be invited back to TVA to study the situation on a more formal basis, to see if it can spot any bottlenecks the local staff has overlooked.

Such a periodic audit ("That's a too harsh a word; I'd prefer 'review,'" said Deese) was planned from the beginning of the Fedsim-TVA relationship. "We've always thought it would be good to have an audit by an outside group, to keep us honest in our own evaluations," Hicks explained.

But the Fedsim-TVA combination is a symbiotic one. Though Deese has found various software tools that Hicks has put to use, Hicks has also developed programs of her own, sometimes at Deese's suggestion, which Fedsim has then taken into its own inventory for distribution to other government agencies.

With an obvious mix of pride in what she has accomplished with her five-man crew and a realistic recognition of what still might be done, Hicks recited a list of 10 or more programs — "mostly home-built" — that she has and would be willing to share with almost any other installation.

## Utilities Adapted to DOS/VS

LYONS, Ill. — Packages originally developed to enhance DOS/360 installations are gradually being converted to DOS/VS as well. Examples of the trend are three products from General Electronics.

The Job Control Statement Editor allows the user to develop and then store on disk whole series of Job Control Language (JCL) statements, thereby avoiding the hazards of trying to maintain JCL cards. The version of this procedure library support software for DOS/360 shops can be acquired for \$300; the DOS/VS packaging costs \$350.

The Device Assignment Controller frees the user of the DOS logic limiting assignment of disk and tape devices to specific partitions. The ability to use any tape or disk drive with any partition became almost as recently as relocatable loaders allowed programs to be shifted to whatever main memory space was available.

Availability of five partitions under DOS/VS, instead of the traditional three

under DOS, gave added impetus to the need for a way of switching units between an operator responsive to the DOS and the DOS/VS versions of this software are each available for \$300.

Op-Ease-One bypasses the multi-programming DOS-imposed requirement of an operator response to an OPED INTERV REQ message and eliminates the possibility of canceling a job by mistake. This is especially important in running any of the current, commercially available spooling packages, General Electronics said. While IBM's coding will not let the user cancel Program by mistake, no such protection is given for other spoolers.

The one-time license fee for Op-Ease-One is \$150 per DOS/VS site, no matter how many CPUs are involved. DOS shops can acquire the object deck for \$100, the source deck for \$200.

General Electronics can be reached through P.O. Box 79, 60534.

## Built for Educational Manager, Package Suits Business Needs

TORONTO — Developed for educational planning and management systems, Campus PMS from Systems Dimensions Ltd. (SDL) appears to be potentially useful in more conventional business situations as well.

The package consists of five integrated components designed to aid in the assembly and evaluation of information about a number of interrelated activities. As many as 2,000 activities, grouped in 50 departments, 10 divisions, 55 administrative units and — in its academic application — from 300 to 10,000 students, are supported by the system, SDL said.

Written in Fortran and Cobol, the Campus subsystems can be used on a variety of CPUs and integrated with pre-existing related programs. The processor subsystem edits data from other systems or files and creates input for the other Campus components.

The cost analysis subsystem allocates expenditures according to user-controlled rules to arrive at activity costs.

In its academic implementation, the operation analysis subsystem displays information on student distribution, course mix, faculty workload and space utilization, and it provides data for the resource planning subsystem.

The fourth subsystem, for resource planning, is a modeling capability allowing users to simulate administrative structures — academic or commercial — to explore "what-if" situations and come up with specific, detailed answers, SDL said.

Finally, the budget review subsystem assists in the preparation of line item budgets, consistent with future plans. The basic problem that blocks immediate use of Campus PMS in nonacademic situa-

tions is a relatively minor one, the vendor noted, involving inappropriate titles on the system's reports.

Campus PMS can be run on IBM 360/40 or 370 series CPUs in the 360 or 370 series on Digital Equipment Corp. Decsystem-10s, Burroughs B5700s and Xerox Sigma 6s. It utilizes about 100K bytes under IBM's OS.

The system can be acquired for \$5,000 including source code, test data, documentation and two days of vendor support. It is being marketed by the Educational Services Dept. of SDL, at 111 Avenue Road, here in Toronto, M5R 3J8.

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## ELS Builds Mini DBMS

FAST CLEVELAND, Ohio — A data base management system (DBMS) "highly oriented toward Codasyl specifications," Product 3 is designed for users of Digital Equipment Corp. PDP-11s but is available for installation on Modular Computer Systems (Modcomp) and some Interdata minis as well, according to the vendor, ELS Systems Engineering.

The DBMS supports real-time functions such as process control and online inquiry and update.

The basic module includes three access methods and facilities for creation of new records, allocation of disk space for the data base and recovery in case of hard or soft failure. The access methods are, in effect, primitives from which users can build a variety of data base structures, the company added.

The system provides an indexed sequential method ("radically different

from IBM's Isam, though the differences are transparent to the user"); relative addressing or direct access ("just because some minis don't provide it"); and multistep chain sequential access.

Product 3 has no self-contained inquiry language but the DBMS logic can be accessed from "any conventional language." Application files are reached through a central index and may be used and maintained independent of Product 3 when that approach seems appropriate.

The system is compatible with DEC software running under DOS, RSX-11M or the RSTS/E supervisors and is superimposed on their basic I/O functions.

Product 3 costs \$7,500 plus installation.

ELS can be reached through P.O. Box 24115, 44112.

## Multilingual Multiprogramming Aided by HP 21MX-Based RTE-III

PALO ALTO, Calif. — Hewlett-Packard (HP) 21MX minis can be transformed into multiprogramming, multilingual machines with I/O spooling and multiterminal monitoring capabilities with the RTE-III disk-based real-time executive just introduced by the mini vendor.

As many as 64 multiterm partitions can be defined for simultaneous use, ranging from program development chores through execution of existing program and management of data. High-level languages available include Fortran IV, Algol and a real-time Basic.

Program execution may be scheduled by time, events or operator command. The system includes a management routine for access to random or sequential files, and disk storage, starting with 5M bytes, can be expanded to 118M bytes, HP

noted.

With RTE-III, individual units in a terminal network may be used for specific types of tasks regardless of what other units may be doing.

Multiterm batch processing is possible, providing job control over program development and other background operations. Optional distributed multiprocessor software allows real-time program scheduling and file management functions from remote satellite CPUs, HP said.

RTE-III can support a variety of peripherals including magnetic tapes, line printers, card readers, plotters and analog and digital I/O interfaces. System software provides power-fail restart.

U.S. price for the RTE-III software to end users will be under \$7,000. Systems houses can obtain the executive for a one-time price "no higher than that" charged end users, and these houses may then copy the software once for every system sold at no additional cost, HP said.

## Macro Use Enhanced On Interdata Minis

OCEANPORT, N.J. — Alternate macro libraries and keyword macro prototypes are among the features of the Macro Cal language processor now available to users of Interdata Corp.'s 7/32 and 8/32 as well as its 16-bit minicomputers, the vendor said recently.

At the same time, the company also introduced Basic/32, which includes an interpreter capable of supporting standard Dartmouth Basic and a range of extensions, for use on Interdata 7/32 and 8/32s in multiterm, terminal-oriented environments.

The ability to use alternate macro libraries allows each programmer under Macro Cal to have his own library of macros tailored to his programs and applications.

At the individual macro level, keyword prototypes make it possible to use symbolic references in the macro routine to arguments or variables in the macro's parameter list.

The Basic/32 package's extensions include matrix handling, string data manipulation and pattern matching. The package's standard features encompass run-time trace facilities with user-controlled SET TRACE and END TRACE commands, matrix operations, an extended interdata statement and INPUT and PRINT via logical unit.

Basic/32 operates under OS-32/MT, is resident in 10K bytes of mainframe memory and sells for \$150. The Macro Cal package requires 24K bytes of memory and sells for \$300. Interdata added from 2 Crescent Place, 07757.

## RSX Software Adapted To Smaller DEC PDP-11s

MAYNARD, Mass. — The RSX-11 line of real-time operating systems from Digital Equipment Corp. has been extended with the introduction of RSX-11S to run on small PDP-11s.

A core-resident system, RSX-11S is a subset of RSX-11M and is particularly suitable for use in "harsh environments" where a disk on a minicomputer system could create problems in reliability, according to DEC.

Programs for RSX-11S use must be developed on a host PDP-11 operating under RSX-11M. Version 2, introduced along with RSX-11S.

The small RSX-11S is licensed at \$1,200 with full software support or \$600 without the support and will be ready in early fall, DEC noted.

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## DBMS Features Told

WELLESLEY, Mass. — Users can now acquire separate technical reports on the specific data base management systems (DBMS) contained in the 1975 edition of QED Information Sciences' *Data Base Management Systems: A Critical and Comparative Analysis*.

Developed jointly by QED and Performance Development Corp., each report provides an "intensive description and analysis" of the system it covers: IMS/VS, Total, Adabas, System 2000 or IMS, a spokesman said.

Each report also contains an in-depth explanation of the criteria used to analyze and evaluate DBMS in general. The same criteria were used to compare the systems with each other in the more comprehensive publication. The individual reports can be purchased for \$60 each from QED at P.O. Box 181, 02181.

## Commitment Needed, But . . .

# Many Utility Packages Too Good Not to Use

By Nancy French  
or the CW staff

CLEVELAND — Some utility software packages on the market are so good it might cost a user more than he thinks not to use them, Gaylord Smith, manager of computer control systems for Nationwide Insurance Co., told Computer Caravan attendees here recently.

It's easy to select a package which ends up sitting on the shelf because it either doesn't solve the user's problem or is too time-consuming to use, he said.

To convince himself as well as his management that what the user is suggesting is really the right choice, he should write a formal proposal including such things as cost; anticipated savings in time, dollars and resources; advantages; and alternatives, Smith said.

Then carefully evaluate the vendors,

keeping in mind "size does not imply quality. A software house whose sole livelihood depends on its software packages is going to be more sensitive to user needs than the large equipment manufacturer."

Finally, he said, the user should make sure he has personnel on his staff to support the package once it's installed. "Unless it's completely turnkey, and few are, somebody's going to have to spend time on it," he said. "And if the package is relegated to someone's spare time, it will never work," he added.

Among the packages Smith expressed mixed feelings about were flowcharters, Cobol shorthand and the data dictionary. Of the flowcharter packages such as Autoflow from Applied Data Research, Smith said they found them to be of little use, explaining "we're not really flow-

chart-oriented at Nationwide.

"Particularly if you're programming in Cobol, you're much more likely to go to the source code than any flowchart," he said.

The flowcharter with its requirement for large amounts of machine time and paper tends to make such packages somewhat less practical today, according to Smith.

On the subject of Cobol shorthand, Smith expressed doubts about having decided against using it. "We're looking at this again," he said. "It saves wear and tear on coders' wrists and keypunch operators."

Smith agreed with one attendee who pointed out that Cobol shorthand encouraged programmers to use good data names since they can write them once and then code in a four-letter abbreviation all the rest of the way.

The data dictionary, designed to keep track of data names, is another tough area, Smith said.

"I'm not convinced that it's not a solution in search of a problem," he said. "I've yet to see a guy come out and say 'I want to see those files or anyone use the report for its own value. You must have manpower to work on these.'"

As for source maintenance packages, Smith said he didn't know how Nationwide would function without Panvalet from Panosopic Systems.

"A program analyzer shows where you can change a program to reduce the number of instructions and make it work faster," he said. But based on Nationwide's experience with Strobe from Program Corp., Smith indicated a need for support from top management to get programmers to use some packages.

In the area of the Cobol post compiler, Nationwide evaluated several and found the Capex Optimizer to be the best, he said. A package that identifies and eliminates unused compiler-generated code, Optimizer can save the user both core and CPU time by eliminating low msec instructions, Smith said.

Nationwide went to Syncsort III from Whitworth Computer Systems, Inc. after continually running out of disk space with IBM's SM-4 Sort, according to Smith.

### No Secondary Sort

"SM-4 had no secondary sort," he said. "Sometimes we were using 200 cylinders when we should have been using 30 or 40," he explained.

The Whitworth sort package not only provided that secondary sort capability but also saved 7% on CPU time and improved elapsed time by as much as 10% to 20%, he said.

Two good sources of information on utility packages, Smith said, are the *ICP Quarterly* and the *ICP Software Newsletter*.

### Correction

In the article, "Do It Yourself! Bad Advice for Utility Packages" [CW, April 23], Applied Data Research, Inc. was incorrectly referred to as Advanced Data Research.

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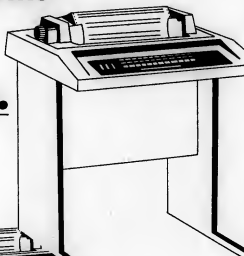
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## Ties Operating Systems Into Nets

# DEC Software to Provide Distributed Processing Basis

By Ronald A. Frank  
Of the CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has introduced a communications software framework with which it plans to implement distributed processing techniques.

Called Decnet, the communications software can tie together previously available DEC operating systems into integrated networks. The software includes three protocols which DEC calls Digital Network Architecture and appear to be the firm's answer to IBM's System Network Architecture.

The first protocol, known as Digital Data Communications Message Protocol (DDCMP), was previously available from

DEC. It operates over full- and half-duplex facilities with synchronous, asynchronous and parallel facilities.

The second protocol, the Network Services Protocol, was designed to handle the routing of messages between systems or within systems. The last is called Data Access Protocol (DAP) and is said to enable programs on one node of a network to utilize the I/O services of other nodes.

By adding the Decnet capability to existing operating systems, users can implement hierarchical, distributed, resource-sharing and communications networks, DEC said.

In order to accomplish these goals, the customer is required to add the Decnet

software as an enhancement to previously announced operating systems.

These include RTS-8 for the PDP-8; RT-11, RSX-11S, RSX-11M, RSX-11D, RSTS/E and IAS for the PDP-11; RSM/DOOS and XVM/RSX for the PDP-15; and the Tops-10 system for the Decsystem-10.

Decnet implementations have been priced for the first three systems, which are scheduled to be available in September. The Decnet software on the RSX-11S will cost \$1,000; on the RSX-11M, \$1,500; and on the RSX-11D, \$2,500.

Availability for the other operating

synchronization and modem operation for the transmission of data bits over a physical link.

Decnet is said to simplify intercommunications between processors by providing three categories of network commands. The first category, dynamic management, creates communications paths and pass data over them.

The second, or File-Sharing commands, allow one CPU to transfer data or request data from a file or I/O device that is part of another CPU system.

The third commands are called Program Control commands and allow one CPU to start and stop the execution of programs

## DG Programmable Multiplexers Form Communications Subsystem

SOUTHBORO, Mass. — A subsystem of programmable data communications components has been introduced by Data General Corp. (DG). It allows DG systems to be configured across varied data communications applications — from small remote terminal systems to high-performance dedicated communication processors.

The subsystem components include synchronous and asynchronous multiplexers, the ALM-16, ALM-8 and SLM-2, for low-level transaction rates, and a data control unit, the DCU/50.

The DCU/50 provides high-level data communications throughput with low central processor utilization and includes software for line control and user interface. These components can be implemented singly or in a variety of combinations for low- or high-level operation and can be easily expanded without altering their software, the company said.

The programmable multiplexers may be used with any DG CPU. The ALM-16 is a 16-line asynchronous multiplexer; the ALM-8 is an eight-line asynchronous multiplexer with full modem control; and the SLM-2 is a two-line synchronous multiplexer.

Any of these may be interfaced to the I/O bus of a DG Nova or Eclipse computer or to the DCU/50.

### User Programmable

The DCU/50 is a user-programmable communications controller that performs character processing and line protocol functions in parallel with a central processor or a dedicated communication processor.

Designed for use with a DG processor, it contains a 2K-byte random-access bipolar memory with 600 nsec instruction speed for add and subtract and a 900 nsec speed for load and store instructions.

One DCU/50 permits communications throughput of up to 48K char/sec; additional DCU/50s can be added to achieve even higher throughput with low processor overhead, DG said. The unit interfaces to the processor through DG's Direct Memory Access (DMA) channel.

In systems with low transaction rates, any of the multiplexers can be interfaced directly to the CPU at very low cost, the company noted. As data communications traffic and systems overhead increases, a user can add the DCU/50 by interfacing it between the multiplexers and host processor.

### Supports Multiple Protocols

One DCU/50 can support multiple protocols with up to 256 mixed synchronous and asynchronous lines through the ALM and SLM multiplexers. An Eclipse or Nova processor may contain multiple DCU/50s for heavy data communications traffic.

Price of one DCU/50, which occupies one card slot in the host chassis, is \$3,000. The ALM-16 sells for \$2,640; one ALM-8 costs \$2,000; and the SLM-2 is \$1,500.

A basic data communications subsystem consisting of a DCU/50 with its software, an ALM-16, an SLM-2, data communications chassis and cabling is priced at \$9,940.

The data communications subsystem will be ready for shipment this fall.

## DNA = Three Protocols

MAYNARD, Mass. — Digital Equipment Corp. has added two protocols to its earlier Digital Data Communications Message Protocol (DDCMP) [CW, Dec. 11].

They are known as Network Services Protocol (NSP) and Data Access Protocol (DAP). Together the three protocols make up what DEC calls Data Network Architecture (DNA).

NSP provides the capability to route messages between systems or within systems. The protocol makes it possible for two programs on different machines to establish a logical communications channel and to exchange data.

NSP allows the dynamic creation of logical communications tasks and can exchange data between tasks on either a solicited or non-solicited basis (through interrupts).

It also allows for the route-through of message traffic within the network, permitting two nodes to communicate via intermediate nodes. Dynamic management of network topology is allowed, and each node is kept informed of the status of other nodes and links in the net.

DAP enables programs on one node of the network to utilize the I/O services of other network nodes. It includes remote file access from sequential and random files and remote device access to unit record devices.

DAP provides for virtual terminal support which allows an interactive terminal physically connected to one system to operate as though it were connected to another system in the net.

DEC has said it will provide specifications for DDCMP, NSP and DAP free on request.

systems ranges from "late 1975 to late 1976," a spokesman said.

Decnet was described as having four levels. The dialog level converts messages sent over a logical link into a "meaningful exchange between users." The logical link level controls the multiplexing/demultiplexing of the message stream to create complete messages in proper order.

This level also is responsible for acknowledgment, message segmenting and routing.

### Physical Link Level

The third or physical link level of Decnet, which serves as the interface between messages to and from the hardware level, is concerned with message error detection and recovery, message sequencing and message synchronization over the physical link. The hardware level is concerned with transmission techniques, character

on other systems in the network.

### Remote Devices

Using the Decnet software, users can control a device at a remote location as if the device were local. This allows satellite systems that have access to all system resources to be created. Terminals on one system will have access to another system and peripherals can be shared among several systems.

It will also be possible to access remote files as if they were part of a local system. And program sharing will allow "loadable programs" to be sent to another system for loading and execution.

In addition, it will be possible to open a data path between programs on an interactive basis. This will allow large tasks to be divided and distributed into smaller units to be executed on different systems in the network, DEC said.

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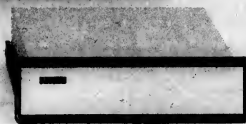
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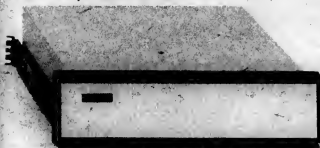
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# MCI Adds Management Functions for Private Line Nets

By Ronald A. Frank  
of the CW staff

NEW YORK — MCI Communications Corp. will soon add computerized traffic monitoring, call routing and other telecommunications network management functions to its private line service.

The additional services will provide users with capabilities that previously could be implemented only through the installation of in-house equipment. Three services called Telemanagement, Telanalysis and Switched Private Line Service have been announced by the specialized carrier.

Telemanagement is described as a combination consulting and computer service which will manage and control intercity communications expenditures for the user. This will include connecting the customer's lines to a computerized switch at an MCI terminal location.

The customer will make all calls in the normal manner and the computer will assure that all calls are routed over the least-cost facility available at the moment the call is initiated, consistent with the individual caller's priority access level, MCI said.

Among a variety of other features, the user will receive detailed cost-allocation reports at the end of each month.

The second facet of this service was designed for companies who already have large private communications networks and seek the capability to access those networks from noncompany locations. This service will allow a customer to access his private network, on a least-cost routing basis and without operator assistance, from any of the 29 cities served by the MCI network.

Management reports, identifying the users and the numbers called, will be provided each month.

## Complete Statistics

No MCI equipment will be installed on the user's premises and complete statistics will be provided in hard copy or magnetic tape format at the end of each month.

As part of the service MCI will provide least-cost routing of calls, identification of calls according to calling party, department to be charged and other required data. The minimum commitment is for 30 days and cost of the service is estimated at "5% of the user's current intercity communications bill."

To implement the Telemanagement service, MCI plans to install a Collins switch or similar equipment.

A typical Telemanagement service to monitor 70 trunk lines would cost about \$20,000 on a 30-day basis or about

\$109,000/year, an MCI spokesman said. Local lines for connection to MCI monitoring facilities would be extra.

## Circuit Analysis

Telanalysis is a combination consulting and statistical recording service which analyzes a user's utilization of his communications facilities and the operating performance of the circuits. It will be available to analyze circuits from MCI and/or other carriers.

Users will be provided with

traffic figures as well as information for later network reconfiguration. Typical cost will be \$3/mo per circuit analyzed. The service will begin in July.

The first equipment to be installed for Telanalysis will probably be a traffic data analyzer from ESE Electronic Systems, Inc., which will be interfaced to a Digital Equipment Corp. PDP-11 processor at the MCI terminal office in Detroit, in mid-1975.

The ESE analyzer will be connected using modems to scan-

ners which monitor private lines at the customer's site, an MCI spokesman explained.

A typical Telanalysis project monitoring 1,800 numbers and 70 toll trunks including local facilities to tie the customer's equipment to an MCI terminal would cost about \$24,900/mo on a month-to-month basis or about \$250,000/year.

## Like Bell's CCSA

The third service planned by MCI is switched private line capability similar to Bell's Com-

mon Control Switching Arrangements (CCSA).

Features of this service will include off-network to on-network access, call forwarding, speed dialing using three digits, etc.

All features of Telemanagement and Telanalysis will be included.

This service will begin in 1976 and pricing will be based on the user's optimized point-to-point requirements, the company said. Pricing for all three of the services will depend on exact user needs.

# NETWORK

## MAXNET CLEARS THE PICTURE.

## MCS Adds Workstations

### For Hazeltine 2000s

ELMSFORD, N.Y. — MCS Designs, Inc. has a new group of workstations designed for the Hazeltine 2000 series of CRT terminals.

The CRT workstations are available for \$200 with a single top and \$250 with two. The firm is at 525 Executive Blvd., 10523.



IBM 3611 Model 2

## For Passbooks, Checks

# IBM 3600 Bank System Gets Printer

WHITE PLAINS, N.Y. — IBM has introduced a banking terminal table-top printer that records bank transaction data on passbooks, checks and a variety of other single or multipart documents.

The IBM 3611 Model 2 passbook printer is one of several printers available with IBM's 3600 finance communication system. It prints 12 char./in. and can operate at speeds of 15 char./sec with a 64-character set

or up to 30 char./sec with a 96-character set.

Users can stack an IBM 3604 keyboard display terminal on top of the printer to create a teller station in limited space. The printer also can be equipped with features that allow two tellers to share the unit.

To operate the printer, a bank teller enters information at a keyboard display unit and then inserts a form into the 3611, which automatically records the

transaction, IBM said.

The Model 2 is available under IBM's Extended Term Plan (ETP), which provides for a two-year contract period, or under the IBM standard rental agreement. Depending on features selected, monthly rental ranges from \$117 to \$127 under ETP and from \$138 to \$150 under the standard plan.

Purchase prices range from \$4,676 to \$5,127, with first shipments in the '76 first quarter.

## Terminal Transactions

### NCR Software Verifies Credit

DAYTON, Ohio — An on-line retail credit communications software system has been introduced by NCR Corp.

The package is said to provide positive and direct control over credit authorization and delinquent-account collections, both of which are critical expense areas in retailing.

The system uses either NCR 280 retail terminals or NCR 285 credit pads for data input. With the 280 terminal, no additional equipment is needed at the point of service for positive credit authorization.

NCR 260 general-purpose terminals can be employed in stores and credit offices for other message transmissions and file inquiries. NCR visual display terminals can also be used for file inquiry, depending on a store's requirements. The various terminals are supported by an NCR 725 minicomputer linked to an NCR Century 101 or larger Century computer.

A variety of other features are included:

- As needed, messages concerning lost or stolen credit cards or bad-check account numbers are sent to a particular store's security office.
- If either the number or dollar amount of a customer's checks cashed during a five-day period exceed a preset limit, the system notifies store management.
- The broadcast and communications feature includes special reports on price changes, markups and markdowns plus the prior day's sales and register reports and allows any store terminal to send a message to any or all other store terminals.
- Flash sales reports showing sales by department can be sent to any store's general-purpose terminal on demand.

The basic software package, which provides credit authorization, rents for \$200/mo. The purchase price is \$10,000.

Four optional modules are available: broadcast and communications, which rents for \$25/mo and has a purchase price of \$1,250; on-line flash sales totals, \$50/mo or \$2,500 purchase price; delinquent-account collection system, \$100/mo or \$5,000 purchase price; and alpha lookup system, \$25/mo or \$1,250 purchase price.

### CTS Execuport Prices Cut as Much as 20%

PARAMUS, N.J. — Computer Transceiver Systems, Inc. (CTS), has announced price reductions for its Execuport line of portable computer terminals.

Cuts up to 20% have been made on prices of all Execuport Model 300 portable terminals.

Four Execuport models were reduced with one version being cut \$805, while the smallest drop was \$315. The reductions include the Model 311, 311C, 320 and 320C.

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## Data Communications

### Course #1010—

#### Practical Data Communications Systems and Concepts

This course will give you the information you need to master the newest developments in Data Communications. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC, HD-LD, DDCS, newly approved major revisions to WATS, and the impact of satellite carriers. This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is \$350. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule is as follows:

Chicago—Jun. 23

Orlando—Jul. 23

Washington, D. C.—Jun. 9-10

### Course #1020—

#### Advanced Teleprocessing Systems Analysis and Design

This course is a follow-up to Course #1010, with special emphasis on problem solving techniques for minimizing operating costs in commercial data communications networks. Also led by Dr. Dixon Doll, the course covers procedures, approaches and algorithms for evaluating and cost optimizing network organizations.

This seminar runs three days, and total cost, including an extensive set of customized course materials, luncheons and continental breakfasts is \$450. Additional registrants from the same company qualify for a reduced rate of \$400. Current schedule is as follows:

Los Angeles—Jun. 16-18

Last day for enrollment is May 16th.

## Data Base Design

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Effective data base system design requires both a complete knowledge of the facilities provided by a data base package, and a basic understanding of the mechanisms which can be employed to construct data base systems. In fact, the former is of questionable value without the latter.

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- Physical Storage Techniques
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- File Integration
- and much more

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You should attend this seminar if you are (or will be) involved in the design and/or implementation of a data base system and whether as a Data Base Designer, Planner or Analyst.

This course runs for 3 days and costs \$350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of \$300. Current schedule:

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You should attend this seminar if you are involved in contracting for the use of computers or computer services—whether as a Corporate Executive, DP Manager, Contract Administrator, Consultant, Inside Counsel, or as a Private Practitioner involved with clients who use computers. Cost for the entire 2½ day seminar, including continental breakfasts, luncheons, and complete resource materials is \$325. Additional registrants from the same company are charged only \$275. Current Schedule:

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## Key-to-Storage Systems

How to evaluate and optimize the various successors to keypunch equipment.

Data entry is a big problem—and a big headache—as every computer user knows. It is therefore a prime target for cost savings. This course is designed to help you in the practical aspects of selecting, installing, and making the best use of keyboard-to-storage systems. It is an expansion and an update of our successful key-disk seminar. Under discussion (including some user case studies) will be:

- Introduction to data entry concepts (keypunch, buffered keypunch, keypunch, key-disk and beyond...)
- Key-disk hardware and software
- Evaluating... and starting... key-disk systems
- Selecting and operating intelligent terminals, both key-to-cassette and key-to-floppy disk
- Key-disk as a remote batch terminal
- Supervisor functions, motivation
- Mixed Media systems
- Trends in Computer Data Entry

This seminar is led by Lawrence Feldman, President of Management Information Corporation, and one of America's leading experts on data entry. All participants will receive a copy of "Data Entry Today", Management Information Corporation's authoritative publication on every aspect of data entry, including a six-month update of this continuing reference service.

You should attend this seminar if you are concerned with optimization of your data entry shop, and especially if you are considering or currently using key-to-storage systems more advanced than basic keypunch. Cost for the 3-day seminar is \$350, including continental breakfasts, luncheons, and all course materials. Additional registrants from the same company are charged only \$300.

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## Bank Tellers' Use of CRTs Brings Shorter Client Transaction Time

**NEW YORK**—In metropolitan New York City, mutual savings banks create new customer service through the application of terminal equipment.

And Robert R. Maller, executive vice-president at Central Savings Bank said the use of bank automation equipment is not exclusively the question of massive computer facilities, but rather the correct use of terminal equipment at what retailers would call point-of-sale. Bank tellers should operate in a similar point-of-sale environment, he added.

Teller workstations at Central Savings have been designed as integral units with each teller operating his own terminal, printers and CRT.

Tellers work on a one-to-one basis with customers, Maller said. "We avoided the typical bank physical arrangement of equipment where tellers move from their workstation to terminals that are shared with other tellers. This can result in a loss of time and possible impatient customers waiting for service," he explained.

At Central Savings, tellers individually process deposits, withdrawals and checks cashed and will soon process installment and mortgage payments—all on an on-line, real-time basis.

At busy branches—and four of Central's offices are in business districts with peak lunchtime and payday periods—"we want to get customers in and out of the office as rapidly as possible." Customers equate time directly with good customer service, Maller noted.

### Processing Time

One goal was to reduce customer processing time to less than a minute. The bank achieved this goal as a result of terminal systems made by Datacube Systems.

The changeover to Datacube began in June 1973. Since completion, the average process time per customer has been reduced from 88 to 37 seconds, Maller reported.

An objective behind the installation of terminal equipment, Maller said, was an increase in teller productivity. Higher teller turnover is common in banking, and one way to reduce the problem is to upgrade skills.

Instead of reacting unfavorably to the individualized terminal system that reduces social relations among tellers, tellers enjoy their new status within a highly automated workstation. It also gives them "increased human relations with customers," he said.

Tellers operate a 58-key alphanumeric keyboard, printer for passbook and vouchers, fixed printers for audit trail and tally roll (which provide tapes for internal and customer usage) and a 9-in. CRT.

Central Savings Bank, like a number of other savings banks here, processes its accounts through a jointly owned, on-line data center, Institutional Group Information Corp., which operates dual Burroughs B6700 computers capable of handling 10 million accounts for its member banks.

The link between the terminals and the central computer is a Datacube D5/20, a processor with 16K bytes of internal storage. It transmits data from terminals to the host computer and each accommodates up to seven terminals.

If the host is not operating, the processor stores transaction information on tape and transmits it upon restoration of service. This approach eliminates the need to repeat every transaction that occurs during downtime.

The bank will enhance its data communications system in July. Remote terminal adapters will be installed at a branch to support the workload from another branch in event of downtime on its local processor.

The bank also plans to have smaller

branches share a single processor. This will occur next year, when Central Savings starts to open smaller suburban offices, as a result of a change in New York State banking laws that permits statewide

## Terminal Transactions

branch banking.

The bank will soon install Datacube administrative terminal systems on the banking floor. These terminals will query the central computer on a wide-range of customer questions that are not-related to transaction entries handled by tellers.

## Edos/Pix Brings RJE Alternative To 360/370 Sites Running DOS

**LARGO, Fla.**—IBM 360/370 DOS users have an alternative to conventional remote job entry (RJE) without the associated costs of hardware and systems resources. The Computer Software Co. and Paradyne Corp. introduced a hardware-oriented RJE system using the Paradyne Pix equipment supported by the Extended Disk Operating System (Edos).

The system, called Edos/Pix, includes all of the remote operational flexibility normally associated with remote terminal operations without sacrificing any of the DOS processing partitions. Through the Edos/Pix facility, operator spooling commands normally available only to the local operator are extended to the remote Pix system. The Pix Remote I/O system is a

communications package that replaces the terminal control unit (370X, 370X), modems, teleprocessing software and RJE terminals. Through Pix, remotely located printers, card readers and punches appear to the host system as local devices. Thus, they are supported by the same Edos spooling routines used for local unit record devices. The Edos/Pix combination provides the 360 or 370 user an RJE capability as well as increased processing capacity, the company said.

Pix costs \$1,325/mo in its basic configuration, while Edos costs \$425/mo on a 24-month lease. The software can be added to existing installed Pix systems. Paradyne is at 8550 Ulmerton Road, 35540.



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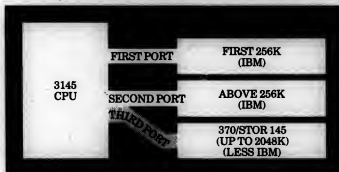
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Progress Report:

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Most 3145 users have been stuck with high-cost IBM memory. Their processor has only two memory ports—one to handle the first 256K, the other to handle additional memory. That means low-cost independent memory had no place to attach, except with major wiring changes to the CPU. The result: only IBM memory could be used. But no more. Cambridge designed—and IBM approved—a totally transparent "third-port" memory that permits any 3145 processor to add any amount of 370/STOR 145 memory, regardless of the amount of resident IBM memory. No messy installation. No fear of incompatibility. Just plug in any amount you need.

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# SYSTEMS & PERIPHERALS

## Bits & Pieces

### NCR Microfiche Reader, Reader/Printer Available

DAYTON, Ohio — A low-cost, compact microfiche reader which magnifies microfiche images to three-quarters of the original document's size and a microfiche reader/printer which can produce electrostatic hard copies of images are available from NCR Corp.

The price of the "three-quarter" reader, called the NCR 456-500, is \$178. The unit weighs less than 17 pounds and measures 1 sq ft by 17 in. high. It is available with lenses providing magnifications of 18, 32 and 36 times.

The reader/printer, designated the NCR 458-500, allows users to make electrostatic hard copies of a microfiche frame with the push of a button. Priced at \$1,395, the reader/printer is available with seven lens magnifications ranging from 18 to 48 times.

### RPM Rejuvenates Used Ribbons

BEVERLY HILLS, Calif. — "If you buy high-quality ribbons, there's no reason you shouldn't be able to get a second, third and even fourth run from them," according to RPM Computer Ribbon Corp.

Client firms send their used ribbons to RPM, which first inspects them for damage. Ribbons in good condition are reinked in the identical shade as the original, placed on new cores, reinspected, shrink-wrapped, repackaged and mailed back to the sender.

According to RPM, the reinking fee costs considerably less than a new ribbon, as much as 50% less depending on the volume of the order.

RPM Computer Ribbon Corp. is at 8500 Wilshire Blvd., Suite 505, 90211.

### Kodak Introduces Four Films

ROCHESTER, N.Y. — Four films designed for micrographics and COM applications have been introduced by Eastman Kodak Co.

- Recordak AHU microfilm is primarily for exposure in standard rotary microfilm devices.

- Recordak print film (Estar thick base), SO-215, is designed to produce flatter microfilm.

- Recordak Dacomat E film is intended primarily for alphanumeric COM units employing high reduction ratios.

- Recordak Dacomat G film, SO-280, is designed for COM systems with graphic capability and will be available in May, Kodak noted.

## At Service Bureau

# Entrex 380 Boosts Productivity 35%

OVERLAND PARK, Kan. — "Valley View Computing Systems handles DP for many different customers, using a wide variety of jobs and processing a large number of small batches. We can't afford errors or delays." That's how Charles E. Lamb, executive vice-president, Valley View, summarized the data entry operations of his service bureau operation.

Valley View is now handling its professional billings with a 35% improvement in productivity, thanks to more sophisticated data entry and source data collection techniques.

The application of remote data collection concepts, in conjunction with improved data entry operations, has enabled Valley View to reduce its error rate, vastly improve turnaround time and increase its customer base while actually decreasing overall costs.

Valley View processes its workload on an IBM 360/30, with five 2314 disk drives. Prior to October 1974, the necessary data entry operations were accomplished using seven IBM 3741s.

In October, a key-to-disk entry system was installed to replace the 3741s. "Working with this system," said Lamb, "we have, as expected, drastically cut the error rate and improved turnaround time. In addition, much to our delight, the remote entry capabilities of this system have enabled us to increase our customer base while decreasing overall costs."

Valley View's data entry operations currently utilize an Entrex, Inc. System 380 with 10 Data/Scope keystations, seven centrally located and three used as remote entry terminals at customer locations. This System 380 includes expanded editing capabilities (allowing sort operations and automatic batch and record end editing) as well as operator statistics, accumulating operator information by the day, week or month as required.

### Simple DP Workload

Valley View's DP services involve complete data management for five banks, including in any given month an average of 500,000 demand deposit transactions (including MICR), 10,000 savings account transactions and 200,000 accounts receivable statements, averaging 51 char./record and 8,000 loan transactions using 70-character records.

Utilizing the automatic functions of the 380, the operators now need key only 10% of these records; the system automatically calculates and inserts the remaining information, reducing keystrokes by 30%.

Once the data is entered, out-of-balance batches are automatically printed out by the system for correction. Previously,

they were printed out by the mainframe in a separate run.

In addition to its banking services, Valley View performs professional billing services as well as insurance transactions for 150 physicians, including complete DP services for several clinics.

These medical transactions amount to 600,000 records/mo, averaging 51 char./record. As with the banking transactions, operators need now only key 70% of each record, resulting in fewer errors and faster turnaround time.

### Distributed Data Entry

Several of Valley View's clients have installed remote keystations in their offices to achieve accurate source data capture and final processing within a 24-hour turnaround time. The rationale behind this action is two-fold:

- Remote keystations decrease overall turnaround time and eliminate the logistics problems involved in moving the source data to a central location.

- Remote entry helps maintain data control and allows source document correction at the customer's level, thus eliminating the necessity of returning in-source documents to the customer for correction.

Lamb also stated that, aided by the operator-oriented features of the system,

clerical personnel completely unfamiliar with data entry have achieved a 4,000 char./hour keystroke rate with no errors — without training.

The remote keystation operation is accomplished by simply keying data on the remote keystation and automatically transmitting it to the Entrex Central Control Group located across town at Valley View. Data communications is economically and accurately accomplished through voice grade dial-up lines using asynchronous protocol.

Lamb also noted one client has been able to replace a small business computer (IBM System/3) with the Entrex capabilities — on a time-saving, error-rate reduction and cost-justified basis.

Lamb noted that Valley View's overall workload has increased since the installation of System 380, and will be able to grow at least 50% more before it becomes necessary to upgrade to a larger system.

Once the equipment was installed, a 20% increase in productivity over the IBM 3741s and a 35% increase in operational productivity over punched cards were realized. Since the necessary data editing and validating are performed on the key-to-disk system before the data goes to the mainframe, the average number of errors per batch has dropped from 100 to 2, and mainframe error runs have been reduced from three per job to none.

# CMI 370/Stor Ups 158 Memory To 4M Bytes at 70% of IBM Cost

BEDFORD, Mass. — An add-on memory system for IBM 370/158 computer processors has been introduced by Cambridge Memories, Inc. (CMI).

The 370/Stor 158-3 memory is expandable in increments of either 512K bytes or 1M bytes up to a maximum of 3M bytes per single chassis. The system can expand 158 processor models 1, 11 and K to their full 4M-byte storage capacity.

Its price ranges from 30% to 40% below IBM memory price, depending upon model and use terms, CMI said.

The system also offers a novel alternative to establishing costly multiprocessor configurations for extra reliability. Because of 370/Stor's reconfiguration panel capabilities, users can effectively duplex main storage on a single 158 processor under operator control.

This mode does not provide the additional processing power of a multiprocessor system, but it does assure the availability of two separate memory systems

for critical on-line applications at a far smaller investment, CMI said.

The recent IBM announcement of VS2 Release 3, which supports multiprocessor 158s of differing main storage sizes, makes 370/Stor 158-3 suited for a main-memory backup function, CMI stated.

A memory reconfiguration switch enables operators to remove failed sections of 512K memory modules from operational use. The memory also has automatic correction of single-bit errors and detection of multi-bit errors, and an off-line switch that permits continued operation of 370/Stor with no IBM memory on line.

A typical 1M-byte memory unit added to a resident 1M-byte memory costs \$155,000 on a purchase basis — or 38% less than IBM list price, CMI said. On a lease basis, the same 1M bytes are priced at \$4,000/mo on a five-year lease, with separate maintenance.

CMI is at 12 Crosby Drive, 01730.

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## Pilot CAI Program Under Way In Elementary Schools of UK

GLASGOW, Scotland — The initial phase of the UK's first Computer-Aided Instruction (CAI) program at the elementary school level is scheduled to become operational here this spring.

During the pilot stage of implementation, 10 primary schools will be covered. A Univac 418-III computer is the key-stone of the Glasgow system.

Full implementation of the first stage is planned to take place over a 12-month period.

Directed by the Education Department of Glasgow Corp., the network is based on a similar system using a 418-III computer which has been operated successfully by the Chicago Board of Education for more than three years.

### 100 Terminals

Each of the 10 schools will be equipped with 10 Univac 100 visual display terminals and one DCT-1000 printer-type terminal. If the pilot project is successful, plans are to extend the system to other city schools. The computer is designed to support a CAI network totaling 50 schools.

Programs written by Univac for the Glasgow project are prepared according to specifications drawn up by Computer Curriculum Corp., Palo Alto, Calif. These programs apply the "drill and practice"

method of individual instruction. The program continuously monitors each child's performance and is designed to supplement conventional classroom instruction.

The system is geared to letting each child perform at his own rate of speed using the Univac 100 display terminals to guide him through a series of small steps. Performance data on each child is printed out daily on the teacher's DCT-100 terminal.

Although principally directed for use in elementary schools, some applications of the Glasgow CAI system will also be available for secondary school pupils showing difficulty in keeping up with their classmates. The older students will use the equipment after the primary schoolchildren have gone home.

## Input Unit Speeds Check Processing

GAITHERSBURG, Md. — A processing system for checks and credit card invoices is scheduled to go into operation at BankVirginia headquarters in Richmond, Va., in July.

The system, from Input Output Machines Corp., is built around an input device which extracts predefined areas of handwriting (the payee and payer) from checks and the entire customer record from standard-form credit card invoices.

The printout for checking account customers is a monthly statement bearing the image of the payee and payer entry and the amount of the transaction as it appears on each check listed in numerical order along with the date of processing and the consequent account balance.

For credit card customers, the statement reflects complete images of signed invoices on a single sheet.

The input machine also records on microfilm a photograph of the check (front and rear) or credit card invoice form. The microfilm can be used for retrieval and duplication.

The input machine is said to handle up to 12,000 items/hour. The output machine produces statement pages at the rate of three sec/page, the company said.

Benefits include elimination of fine sorting, hand filing and excess postage, since up to 150 line items can be mailed under the lowest postal rate with the bulk of checks and credit card invoices eliminated, the firm said. The images extracted for printout are digitized so that existing computers can manipulate the data.

The input machine is priced at \$135,000; the output machine will sell for \$140,000 from the firm at 1 W. Deer Park Drive, 20760.

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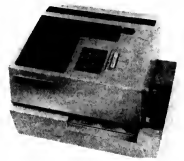
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Standard Register Weighmate

## Standard Register Offering Weighmate, Source Record Punch

DAYTON, Ohio — Weighmate, a calculating source record punch (SRP), has been introduced by The Standard Register Co.

The device is designed to accept binary coded decimal (BCD) output from electronic weighing systems for computation and then output on multiple-copy Zipcard forms which include card copies for input to computer systems.

An item's gross weight is accepted from the scale and entered either directly, if the units are cable-connected, or from the keyboard. Other information can be entered through the keyboard and the unit computes the net weight displaying all figures for a visual check.

That data plus information from other input will be transferred to the Zipcard form along with the printed interpretation.

Additional sources of input include extra keyboard entries, master tab card, badge, the SRP internal slide switch settings and clock or other digital BCD output device.

The machine has a 10-key keyboard and weighs approximately 95 pounds. An option is available permitting the accumulation total of net weights from multiple transactions and entering this data each time into the Zipcard form along with the individual transaction data.

Prices for the units will start at \$7,600 or \$260/mo rental from the firm at 626 Albany St., 45401.

## Processes up to 1,500 Orders per Day

## System Calculates Discounts for Liquor Wholesaler

ST. PAUL, Minn. — Nearly everyone in the business offers cash discounts for volume case purchases, but Johnson Brothers Wholesale Liquor Co. provides other discount options too.

Moreover, it has developed a computerized system to invoice them quickly and accurately.

"The discounts change every week or two," said Douglas F. Mangine, the company's director of internal operations, "but it

takes no time at all to update our computer files."

"Counting different brands and sizes, we stock more than 1,700 different items," Mangine explained. "No one salesman could possibly provide a customer with the kind of service he needs if the salesman had to keep record of discounts and special buys for everything we carry."

The headquarters here processes up to 1,500 orders per day.

Even before such volumes became routine, management saw that conventional accounting techniques would not be adequate for maintaining 24-hour turnaround on orders.

## Upgraded to Century 101

In January 1974, the company upgraded its DP capability by replacing the original configuration with an NCR Corp. Century 101.

In addition to a 32K CPU, the 101 has a card reader, a 1,200 line/min printer and 60M-byte NCR 657 disk drive.

The four-option Johnson Brothers discount is calculated when applicable according to the preference of customers when orders are prebilled. Input requires only the keypunching of the customer number, the item codes, the quantities and a discount code if applicable. After

making sure the new order does not exceed the credit line and limit for the account, the computer calculates the perpetual inventory maintained in disk storage to be sure the order can be filled.

With any back-order notations made as necessary, the order is printed out on an eight-copy form. Superimposed on the first copy is a stencil shipping label and a carbon which reproduces the information on the first copy and is used to identify all boxes for delivery.

In addition to extended prices and discount data, the invoice specifies the warehouse location for picking each line item and identifies the company truck route or common carrier the order is to be delivered by, along with any special instructions.

Automatically, Mangine said, since all information is stored on magnetic disk packs, the processing of on/order billing deletes the perpetual inventory, updates accounts receivable, adds to the cumulative commission earnings of salesman and compiles detailed sales statistics.

## Daily Management Printouts

On a daily basis, he said, the computer produces the following management printouts:

- A sales register which shows how much each salesman sold of each brand to which customer, along with the individual dollar totals.
- A cumulative gallonage report for the state government.
- The inventory status of each item in stock, along with the safe and economic reorder points.
- Sales by supplier, broken down by item.
- The activity of each salesman by item.
- The sales for each supplier by salesman, by customer and by item.

There is some redundancy, but resorting essentially the same body of information with different emphasis helps management get a clearer picture of specific areas of activity, Mangine said.

This can be done economically with the computer, he said, because all of the statistical breakdowns are produced during the normal business day after the on/order billing and inventory stocking has been processed.

On a weekly basis, reports are printed. These include the commissions earned by each salesman per invoice, the dollar volume done by each salesman and the gross profit he earned.

An on-call inventory status report compares the current year to the previous one, and a breakdown by salesman and by customer shows current sales, those for the previous month and the year to date and those for last year to date.

Another 30-day report reveals brand performance by case with those of the 12 previous months.

The accounts receivable system is an NCR-supplied system that allows for both open-item and balance-forward statements. It does aging on daily basis and produces statements on call.

NOW 551 Per Month Buys You  
DATA 100 Batch Terminal Performance

The new DATA 100 Model 100 is a batch terminal system designed for high-speed data processing. It features a built-in terminal, a 100MB disk drive, and a 100MB tape drive. The system is designed for high-speed data processing and is capable of handling up to 1,500 orders per day.



## Mini Bits

### PDP-8/I Handles 64 Lines

#### With Standard Interface

WELLESLEY, Mass. — The Asynchronous Line Interface (ALI) from Standard Information Systems equips the Digital Equipment Corp. PDP-8/I (or the PDP-8/E with external bus) to handle up to 64 lines, with the ALI providing program control of line speed, word size and parity, the vendor said.

ALI provides program control of eight speeds between 50 and 9,600 bit/sec, detects both ends of received "break" signals and transmits breaks. Echo and loopback capabilities are included.

The equipment rack-mounts into the PDP-8. A 32-line configuration costs \$9,100 from the firm at 36 Washington St., 02181.

#### Wang Drive Accepts Standard Tape

TEWKSBURY, Mass. — A 9-track tape drive from Wang Laboratories, Inc. accepts industry-standard 800 bit/in., half-in. magnetic tape and adds computer data exchange and archive storage capabilities to Wang's WCS and System 2200 computer lines.

The Model 2209 tape drive, which reads and records in universal NRZI mode on reels up to 10-1/2 in. in diameter, comes with software that eliminates the need to program tape-handling operations (blocking, file positioning, etc.).

Additional special software includes automatic error-recovery routines and programs to interface the tape drive with other Wang peripherals such as disks and telecommunications controllers.

The drive also includes a built-in tape cleaner. Reading and recording speed is 12-1/2 in./sec.

The tape drive sells for \$12,000, while the input/output logic is \$500. The firm is at 836 North St., 01876.

#### Add-On Memory Plugs Into PDP-11

ENGLEWOOD, Colo. — The Monostore VII/PDP-11 from Monolithic Systems Corp. is a semiconductor memory system designed to plug into the Digital Equipment Corp. PDP-11 Unibus.

The add-on system is based on a 4K by 1 bit NMOS dynamic random-access memory (RAM).

Standard units are wired for 64K or 128K with word lengths of 16 or 18 bits. Other organizations are available.

The minimum capacity of 16K by 16 or 18 bits is expandable in 4K increments. Dual port systems are available.

A 128K by 16 bit system costs 66 cents/bit from the firm at 14 Inverness Drive East, 80110.

## Prepares Firm's Financial Reports

# VIP-100 'Understands' Human Speech

HAYES, England — Some of the problems of controllers, statisticians and accountants face with computer-based management information systems have been eliminated at EMI Ltd. by using speech to communicate with the computer.

Said to be one of the first operations of its type in the world, accounts with EMI's \$100 million Commercial Electronics Operations capture monthly financial information on a system which understands the human voice.

This approach eliminates the intermediate paperwork and card punching/verifying normally associated with data preparation.

The financial staff members themselves seek the information or instructions to the Threshold Technology Inc. (TTI)

VIP-100 to provide the monthly financial statistics based on data received from the group's 16 subsidiary companies and divisions.

The TTI equipment used includes a speech preprocessor unit, minicomputer, visual display unit, microphone headset and teletypewriter.

#### Processing Statistics

To enable the system to process these monthly statistics, a small, selected vocabulary of words and phrases are spoken into the system. As the user speaks the financial data, each word is recognized and the minicomputer performs the data analysis, formatting and reporting according to the program of operations loaded in its memory.

First-time users of the voice-operated

computer system "train" the equipment to understand their individual pronunciation of the vocabulary by repeating each word five to 10 times into a microphone.

An information is voice-entered, each word spoken appears on a visual display unit enabling the user to verify his input. After the information has been entered, the system produces a typewritten master for reference purposes and a punched paper tape for subsequent computer entry.

John Perera, chief accountant of EMI's Commercial Electronics Operations, said, "The system became operational after the first test run and for the last two months has provided management with the main financial and operating statistics of each division together with consolidation and summaries with 100% accuracy."

## Nova System to Help Guide Panama Canal Ships

By Patrick Ward  
of the CW staff

PANAMA CITY, Panama — A minicomputer may soon be central to the Panama Canal Co.'s task of guiding ships from one end of the canal to the other.

The company assigns its own experienced pilots to take command of a ship during the transit. But even if the pilot is familiar with the canal, it still helps him to know a lot about the ship he is temporarily handling, according to David Prongny, manager of product development for Boeing Aerospace Co.'s Houston branch.

Boeing has assembled and programmed a minicomputer system that will provide pilots with that sort of information, and will also alert the Marine Traffic Control Center staff on what resources they'll need to handle particular ships.

That aid could be valuable, since about 40 ships already travel the Panama Canal in both directions daily, and the number is expected to rise in the future, further taxing both the marine traffic controllers and associated support operations.

Due to become operational next summer, the mini will also drive a 48-foot-long "ship position display board" for the benefit of the ship controllers at the traffic center, Prongny stated.

The minicomputer system is built around a Data General Nova 840 under RDS with Digital Development Corp. fixed disks and Data General moving-head disks, a Perdigon Interface Corp. tape formatter and Cipher Data tape drives.

The ship controllers will work at 30 Contrac CRTs at the traffic center. A Ramtek video generation unit will drive the CRTs.

Other canal officials will enter data and receive reports on 24 remote GE Termi-

net terminals.

The traffic center plans to put a data base of 8,000 to 10,000 ships on the system. By entering the name of a ship about to enter the canal, the traffic center staff will obtain a report on the physical characteristics of the ship, the type of piloting crew the canal company will have to assign to it and towing and other requirements.

Another software module will match up the canal company's available pilots with particular ships. Pilots will receive an information package for the ship to help them in piloting and a planned schedule

for the ship's transit through various points in the canal.

The ship traffic display board, built of four connected sections six feet high by 12 feet long, will reflect information entered along the length of the canal. Lighted numbers will signify each ship's position, and the system will also indicate fog patches, lock troubles or other problems.

The Boeing turnkey system will cost the canal company about \$2.6 million, Prongny said, including training and one-year maintenance.

## Basic/Four 24K Machine Cuts Time Between Billing, Job End

BALTIMORE — No one in the printing business needs to be told time is money.

By shifting its accounting work from tab equipment to a 24K minicomputer, French/Bray printing company here cut the time between job completion and billing from two weeks to two days, according to Vice-President Paul Stotler. Beyond that, management reports from the previous system often came too late for corrective action, he said. The minicomputer garners this information much more quickly.

The tab equipment had become outmoded by the time the company hit \$2 million in annual sales, Stotler said. Sales should reach \$3 million this year.

Moved to Basic/Four Mini

French/Bray decided on the Basic/Four Corp. machine after visiting other print-

ing firms that used that mini together with software developed by T.H.O. Mares, Inc.

French/Bray currently uses its mini for payroll, cost accounting, work in process, accounts receivable, statements, sales analysis, production reports, salesmen compensation, productivity performance and some inventories.

The system is now being programmed for inventory control of raw printing papers. French/Bray is also considering computerized job cost estimating, but this is "off somewhere in the future," because of the number of variables involved, Stotler said. However, "We feel it is an attainable goal," he added.

French/Bray uses a Basic/Four Model 400 processor, a disk drive with one fixed and one removable disk, a 165 char./sec printer and a CRT.

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# HP 3000 Reduces Financial Risks in Resources Search

HELSINKI, Finland — Geological Survey of Finland (GSF) has installed a minicomputer system as an aid in its nationwide search for natural resources and it has become an indispensable tool in minimizing the financial risks in prospecting.

"Modern prospecting is very much like detective work," noted a GSF scientist. "We are feeding the computer large amounts of the most accurate and varied data we can uncover. From all these clues, the computer will draw the logical con-

clusions, but the conclusions can be only as valid as the clues themselves."

Because this modern prospecting process requires continuous computer-human interaction, GSF chose a computer offering terminal capability. The Hewlett-Packard (HP) 3000 enables several users concurrent access through both interactive terminals and batch devices.

Tailored to the needs of the institute, the minicomputer system offers Fortran, Basic, and SPL, HP's systems programming

language. Users also can have access to on-line test instruments and special peripherals through an HP 2100 programmable controller.

In one application — airborne geophysical surveying — instruments aboard a plane gather some 10 geophysical parameters together with time, altitude and navigation data. The minicomputer later processes that information and merges it with data from samples taken on the ground.

The results are maps drawn by

the computer that indicate magnetic, electromagnetic and radiometric anomalies indicative of ore deposits and other geological structures.

In the search for mineral deposits, rivers and springs within a "geologically interesting" area are systematically explored. Collected sediments are analyzed and some 20 elements and their respective concentrations in the samples are identified.

This geochemical data and information on the location and general environment of the area

where the samples were gathered are entered into the minicomputer system. The resulting maps locate concentrations of each element or combinations of several of them present within the area.

The HP 3000 system hardware includes a 128K-byte CPU, a 2M-byte fixed-head disk, a 47M-byte moving-head disk, an HP 2100 programmable controller with 8K of memory, 800-bit/in. magnetic tape drive, 200 line/min printer, 600 card/min card reader and a photoreader.



## Lockheed System III

**The only multi-terminal small business computer you won't outgrow every time you grow.**

Introducing the Lockheed System III, now with new multi-terminal capability. That's good news whether you plan to use a small computer system or plan to sell them.

System III is designed to grow with you. You can buy what you need now; expand systems when you want. With the new multi-terminal System III models, you can connect up to eight auxiliary terminals, both local and remote. That means nine people can be using the computer simultaneously. With this capability, System III is the most cost effective business computer you can buy.

Interactive capability includes data inquiry/entry and on-line file updating. Each terminal features multi-function foreground operation. And what could be better for inventory control and order entry applications, while your batch processing continues in the background.

Plus you've got a system supported by industry compatible RPG II software, as well as assembly language and FORTRAN. System III also includes File Management,

Sort/Merge, operator utilities and editors, all under the control of the Disk Operating System. It can be expanded to 64K bytes, four disk drives providing 20 million bytes on-line, up to 600 LPM printer, and six models of 80 and 96 column card devices.

So if you're interested in a small business computer that can be eight times more useful to you, let's talk. If you want information about using the Lockheed System III, call our nearest office. If you'd like to become a System III dealer, call collect, (213) 722-6810. Or write 6201 East Randolph Street, Los Angeles, CA 90040.

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**Lockheed Electronics**

Data Products Division



## Comtal Releases High-Resolution Image Processors

ACADIA, Calif. — Comtal Corp. has introduced a series of digital image processing systems featuring four times the spatial resolution of its previously available digital image displays.

The 1024 series stores and processes image information in a digital manner. The operator may interactively work with the high-resolution images in real-time. The systems employ a 1K by 1K picture matrix which produces a clear, sharp, bright and flicker-free picture, the company said.

### Three Bit Sizes

The 1024 systems are available as a 4-bit system which stores and processes 16 brightness levels (shades of gray), a 6-bit system for 64 brightness levels and an 8-bit system for 256 brightness levels.

The systems interface with most major minicomputers, the firm said.

The 1K-by-4K-bit digital image processing systems start at \$55,000 from the firm at 333 N. Santa Anita Ave., 91006.

## Storage Future

### Workshop Topic

LAKE ARROWHEAD, Calif. — The IEEE Computer Society will sponsor a workshop on "Advances in Storage for Minis and Micros" here Sept. 3-5.

The workshop will cover the future of mechanical memories and serial solid-state and optical devices. Also to be studied is the architectural implications of these developments as they influence minis and micros.

An invitation to the workshop is available from R. Bonetti, Burroughs Corp., 25725 Jernimo Road, Mission Viejo, Calif. 92675.

## Versatec Lowers Prices

CUPERTINO, Calif. — Versatec has reduced prices from 5% to 15% on its dual-array electrostatic printers and plotters. Versatec officials say higher volume has significantly reduced production cost.

The price reduction covers the entire line, including the high-resolution, dual-array, 200 dot/in. D1200A printer/plotters. This unit has been reduced in price from \$9,700 to \$8,400. The firm is at 10100 Bubb Road, 95014.



# on to NCC ....

This section previews the products that will be shown at NCC next week. The agenda and a schedule of adjunct meetings are also included.

## HP to Exhibit M/30 Processor, Real-Time Executive for 21MXs

ANAHEIM, Calif. — Hewlett-Packard (HP) will demonstrate its real-time executive (RTE-11) and exhibit the M/30, newest in the 21MX line of processors, in booth 1437.

In addition, the firm will show the Model 7905A 15M-byte cartridge disk drive with a usable data capacity of 10M bytes. It also features a 5 msec track-to-track seek time for a 25 msec average.

dynamic mapping is similarly \$13,629.

The least-costly 128K model (which uses an extender) is, on the same terms, \$23,859.



## Miniworld At NCC

Data transfer is at a rate of 7.5M bit/sec. The 7905A disk drive with a 13037 controller is priced at \$8,400, with additional drives priced under \$5,900.

The disk-based real-time executive RTE-11 can manage as much as 256K words (512K bytes) of memory and can transform HP 21MX minis into multiprogramming, multitasking machines with I/O spooling and multiterminal monitoring capabilities, HP said.

Up to 64 multiuser partitions can be defined for simultaneous use, executing and developing programs and managing data in a variety of high-level languages including Fortran IV, Algol and Real-Time Basic.

The system includes a file manager for easy access to random or sequential files. Disk storage can start at 5M bytes and can be expanded up to 118M bytes.

### Top of the Line

The newest processor in the Hewlett-Packard 21MX series, the M/30, is the top of the line in memory and power I/O accommodations, HP claimed.

The processor can self-contain up to 128K words (256K bytes) of high-density semiconductor memory and 14 powered I/O channels. The M/30 processor now makes it possible to configure a 128K 21MX at a price 25% lower than with earlier hardware, HP said.

The standard configuration of the M/30 has 128 instructions, including floating-point firmware, memory parity, extended arithmetic unit, bootstrap loader and full operator panel.

The price of an M/30 processor with 32K words of 4K random-access memory (RAM) can be as low as \$8,382 in OEM quantities of 50. A 64K model with

### Two Core Memory Systems

### For GA SPC-16 to Be Shown

ANAHEIM, Calif. — Two core memory systems designed to operate with General Automation's SPC-16 line of computers will be unveiled by Standard Memories in booth 2304.

The units are available in 16K-byte or 32K-byte sizes and are pin-compatible with all members of the SPC-16 line, Standard said.

Units compatible with the SPC-18 are also available, the firm added from its Fort Lauderdale, Fla., headquarters.

# Say goodbye to PDS compression. Say hello to UCC SIX!

Announcing UCC SIX. A new software package that eliminates PDS compression, because it automatically inventories and controls your PDS disc space.

UCC SIX means the virtual end of ABENDS and "dump and restore" operations caused by exhausted PDS disc space. Go ahead and use the programmer and machine time normally needed for compression on more important jobs...like making schedules. You even save money on your PDS investment, since UCC SIX utilizes PDS space more efficiently.

Go ahead, say so long to some old nuisances. Introduce yourself to a new friend. UCC SIX.

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- ☐ UCC ONE (Tape Management System). A system that protects your data under OS operation. Provides real-time record of tapes jobs.
- ☐ UCC TWO (DOS under OS). Lets you run DOS programs under OS control without reprogramming. Puts you in charge. Saves time money. Prevents confusion.
- ☐ UCC SIX (PDS Space Management).
- ☐ UCC TEN (Data Dictionary/Manager). For IMS users, this system centralizes, controls data definitions, provides powerful cross reference features, automatically generates data base control statements, facilitates new systems design.
- ☐ UCC FIFTEEN (Resident Management System). Saves hours on relocating OS jobs. Simple, sophisticated software automatically corrects OS catalog, CDC biases before you rerun or restart.

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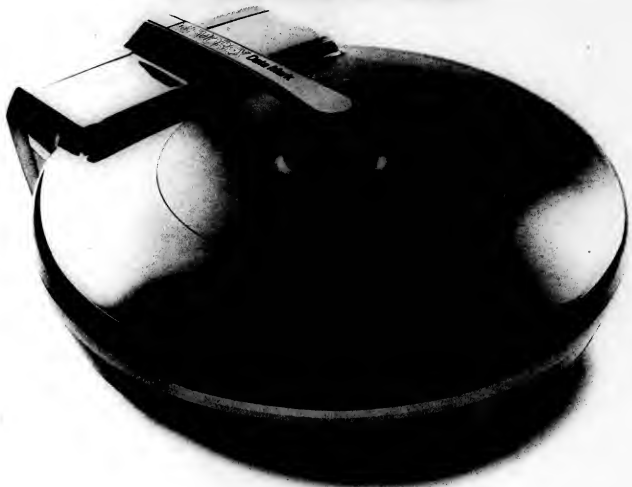
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# The New Memorex Data Mark: Already a Proven Performer.



The new Memorex Data Mark Module has been so well received in the marketplace that there are more Data Marks in field operation than those of all the independent competitors combined.

To produce a reliable product like Data Mark requires years of experience in manufacturing digital media, magnetic recording heads, and disc drives. Memorex's 12 years of experience led to the proprietary formulation and processing techniques for the recording coat of Data Mark that makes it unique. This tough "armor coat" significantly extends the Data Mark's durability and enables it to withstand increased stress of head landing.

In addition to the armor-tough recording coat, the Data Mark features the durable Memorex 100X top coat. This smooth, durable shield protects your valuable data and, working in combination with the recording coat, extends the life of the disc over 100 times the life of a normal disc that does not have the Memorex dual shields.

The key reason the Data Mark has been so well received is because of its unique oxide particle alignment. The oxide particles encapsulated within the extremely thin coatings are circumferentially aligned on the disc. And it's precisely this alignment that is responsible for the Data Mark's high signal output and data resolution.

The Data Mark stores 70 million bytes and is available with the fixed head option. Either of the two configurations gives you the memory excellence from which Memorex has gained its reputation.

Call your Memorex representative or write: Memorex Corporation, 1125 Memorex Drive, MS-0064, Santa Clara, California 95052.

## MEMOREX

## Media III Displaying Systems Plus Disk, Memory Peripherals

ANAHEIM, Calif. — Two complete minicomputer systems plus a mini disk system and a mini memory system will be displayed in booths 2422 and 2424 by Media III.

The firm's Minicomputer Business System (Micos) uses a version of Extensive Basic as its primary programming language. Features such as multiple indexing, simultaneous opening of multiple files, full file security and print spooling are standard, the firm said.

A basic Micos system is comprised of a Data General Nova with 32K bytes of core memory, a fixed/removable disk with 10M bytes, a line printer and one or more CRT/keyboards. Expansion up to 320M bytes of disk storage is available, as is a solid-state swapping memory which allows up to 30 or more time-sharing terminals on one system.

System prices start at under \$40,000.

### Storage System

The newest member of a family of mass storage systems from Media III is the Model 2620-06X moving-head disk system, which provides storage capacities up to 266M bytes for users of Data General systems.

A basic system includes one Control Data Corp. Model 9760 storage module drive (SMD), one Media III Model 2602 controller, cables, documentation and diagnostic software.

This basic system uses a removable disk pack with a formatted storage capacity of 33.3M bytes. A maximum of four SMDs can be attached to one controller. The CDC Model 9762 SMD may be substituted for the Model 9760, providing a basic system capacity of 66.6M bytes and a fully expanded capacity of 266M bytes.

The system is software-compatible with Media III Model 2610 disk cartridge systems and with Data General Model 4047 disk systems.

The SMD spindle rotational rate of 3,600 rpm provides 8.3 msec average

latency time and peak data transfer rate of 625K, 16-bit word/sec via a Fifo buffer in the controller to the DMA channel of the computer. Price is from \$15,000.

### Mini Disk System

The Media III Model 2610-040 mini disk system for Data General minis features moving-head disk drives and is

## Miniworld

At  
NCC



suited for dedicated applications using the Nova 2/4.

The basic system is comprised of one disk drive, a Media III Model 2601 disk controller, cables, documentation and software.

The system is software-compatible with all Data General 4047 disk software, including RDOS. The Media III Controller can control four daisy-chained disk drives.

A complete 2.5M byte system is \$4,495. The Media III Model 1000S disk-based minicomputer system is based on a Data General Nova minicomputer with 16K bytes of core memory, a 2.5M-byte disk memory and keyboard/page printer with paper tape reader/punch.

The system is supplied with a disk operating system with file management and single user Basic capability. Also included is an automatic program load feature from disk to minicomputer main memory.

The system is also completely compatible with, and will run, Data General's RDOS software. The unit is priced at \$9,995 from the firm at 2259 Via Burton here, 92806.

## ADC Set to Present Series 20, 62, 70

ANAHEIM, Calif. — Three new products will join Applied Data Communications' line of minicomputer peripherals in booth 2342.

The new products include the Series 20 programmable read-only memory (ROM) quad board product line, expanded to include 512- and 1024-word reprogrammable ROM quad boards for Digital Equipment Corp. DEC PDP-11 and PDP-8/E.

The Series 62 intelligent miniperipheral is a microcomputer and IBM-compatible floppy disk or 3M cartridge system with capability expansion in firmware, disk operating software, communication interface and full peripheral support.

The Series 70 microcomputer is a one-board design for OEM or a full system for end user. Intel Corp. 8080 software compatibility for user program development and Micro-DOS software for user application are features. Peripherals include IBM-compatible floppy disk, 3M Co. tape cartridge, printers, 9-track tape, programmable communications interfaces, ROM programmer, real-time clock/timer, nonintelligent CRT and graphic devices.

Other products on display will include the Series 20 programmable ROM quad board for DEC PDP-11 in 128- and 256-word sizes; the Series 41 program loading unit for DEC PDP-11; the Series 42 3M tape cartridge system; and the Series 61 IBM-compatible floppy disk system demonstrated on DEC PDP-8, DEC PDP-11, Data General Corp. Nova and Intellex 8/Model 80.



This ADC system will be featured in booth 2342.

The firm is at 1509 E. McFadden Ave., Santa Ana, Calif. 92705.

## Raycorder 6406 Line From Raymond Bowling

ANAHEIM, Calif. — The latest models of the Raycorder line of digital cassette recorders will be unveiled in booth 2356 by Raymond Engineering, Inc.

Designed for minicomputer and word-processing applications, the Series 6106 models offer the basic transport unit with either read/write or read-write-write options and single- or dual-direction data transfer operation, the firm said.

The Series also includes the basic tape transport plus read preamplifiers and write amplifiers.

The Series 6406 includes the 6106 features plus additional electronics that provide for a fully digital interface with all command and control function provided along with phase-encoded serial data I/O. Tape speeds are from 3- to 30 in./sec, according to the firm at 217 Smith St., Middletown, Conn. 06457.

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## Sykes Plans Diversified Display

ANAHEIM, Calif. — Sykes Data-ronics, operating out of booths 2605 and 2607, will be displaying four basic products: floppy disk systems, floppy disk controllers, communications cassette systems and 3M cartridge transports.

The Series 7000 flexible disk system provides one of two IBM-compatible disk systems, complete with interfaces to a variety of minicomputers. Available software consists of diagnostic, sample drivers, IBM routines and complete operating systems. A dual sector buffer option is also available.

The controller portion of the flexible disk system is also available for OEM applications. The controller is housed in a single card cage which may be adapted to a user's package.

The dual sector buffer option is also available, as are interfaces for several different disk drives and different

minicomputers. The price of the controller is \$610 in quantities of 50 per year.

The Series 3000 single or dual cassette system with an RS-232 communications interface will also be displayed. This system offers either on-line or off-line operation, and provides interfaces for modern devices as well as terminal devices.

Options include high-speed search and typical single transport unit sell for \$2,600.

The firm will also display a 3M cartridge transport, the Model TT140. This system provides one, two- or four-track capability with either a standard read/write head or an optional read-after-write head.

OEM pricing at the 50 quantity level is \$511, the firm said from 375 Orchard St., Rochester, N.Y. 14606.

## American Videonetics to Launch Magnetic Cartridge Recorders

ANAHEIM, Calif. — Two cartridge recorders will be introduced in booths 2714 and 2716 by American Videonetics Corp. The DI-112-03 has a capacity of 152M bits or 19M bytes and has a read transfer rate as high as 768 kbit/sec. When the unit is formatted as a typical floppy disk (256K bytes), random access time is said to be 50% faster than floppy disk.

Because of the storage capacity, the unit can store the equivalent of 50 floppy disks on a single tape and move from "disk" to adjacent "disk" in less than 4 sec. Moving from the first to the 10th "disk" down the line takes 3.5 sec, the firm said.

The unit is priced at under \$1,000 per drive only in OEM quantities and \$1,200 for a drive with basic read/write electronics and control software.

The MDR-212 uses a "Reelrite" that contains 80 feet of 1/4-in. tape. There are two models of the Reelrite, containing room for either 750K bits or 1.5M bits of unformatted data.

## Miniworld

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Standard operating speeds are 10 in./sec read/write and 30 in./sec gap search. The lower capacity model will sell for less than \$140 per drive only and under \$300 per drive with read/write electronics and motion control.

The dual-capacity unit with electronics will be priced at under \$540 in OEM quantities, the firm said from 795 Kifer Road, Sunnyvale, Calif. 94086.

## Wangco Showing Drive Equal to S/32 Module

ANAHEIM, Calif. — Wangco will show a nonremovable media magnetic disk drive, featuring capacities equal to the recently announced IBM System/32 disk storage module, in booth 1517.

The Series N/332 drives utilize Wangco's electromagnetic voice coil actuator and optical detent system, providing track-to-track access time of 15 msec and full stroke time of 150 msec, with 70 msec average.

The N/332-2212 features two fixed disks, 200 track/in. and recording density of 2,200 bit/in., providing 100M bits of capacity.

The N/332-2212, with one fixed disk, has a capacity of 50M bits. Both models have a transfer rate of 2,500 kbit/sec at a disk rotation speed of 2,400 rpm.

OEM quantity price is under \$2,000 from the firm at 5404 Jandy Place, Los Angeles, Calif. 90066.

## Semiconductor Memories To Be Monolithic Theme

ANAHEIM, Calif. — Among the semiconductor memory products Monolithic Systems Corp. will feature in booths 1500, 1502 and 1504 is the Monostore V/PDP-8EFM add-on memory board that plugs directly into the PDP-8E, F or M Omnibus at half the price of the conventional core add-on memory.

A second product, the Monostore VII/PDP-11, a low-cost semiconductor memory system designed to plug into the PDP-11 Omnibus, will also be displayed.

The VII/PDP-11 is based on a 4K NMOS dynamic random-access memory (RAM) and provides up to 128K by 18 bits in a single 5-1/4-in.-high freestanding or rack-mounted chassis.

Standard units are wired for 64K or 128K with word lengths of 16 or 18 bits. In addition, Monolithic will display its Monostore VII/Planar, a read-write random access semiconductor memory designed for use with microprocessors.

Single-unit price for the V/PDP-8EFM is \$560 for the 8K system. The VII/PDP-11 costs .66 cent/bit for the 128K by 16 system.

## Halon 1301 to Be Put Out

ANAHEIM, Calif. — Dupont will demonstrate the capabilities of Halon 1301, a fire extinguishing agent, in booth 1121 and 1123, the firm said from its headquarters in Wilmington, Del. 19898.

# 3330 plug-compatible disk drives from Randolph

RCC/7330 disk drives provide IBM S/360 and IBM S/370 users with high performance at savings of 30% or more

Over eight thousand Model 7330 disk drives are running round-the-clock on S/360 S/55 and S/370's throughout the U.S. They match the performance of IBM 3330 disk drives in every vital comparison except one — price. The RCC/7330 disk drives offer Randolph customers savings of 30% or more and you still get the same storage capacity of 100 or 200 million bytes per spindle, transfer rate of 800,000 bytes per second and error correction with automatic detection and retry.

RCC/7830 Storage Control Unit—key to high performance at low cost

Plug-to-plug compatible with IBM's 3330 on S/370  
Connects to S/360/50 and S/360/55 via a selector channel  
Provides for control of one to sixty-four RCC/7330 disk drives, permitting incremental storage additions of 100 or 200 million bytes up to 6.4 billion byte system  
Dynamic dual-port capability offers substantial advantages over string-switching to the multiple CPU and/or controller user by allowing simultaneous access to spindles in any system

RCC/7330 uses IBM 3336 or equivalent disk packs

Each pack is interchangeable on any RCC/7330 or IBM 3330 drive. Provides nineteen surfaces for data storage. The twentieth disk surface is used to control servo-seeking, track following, rotation-position sensing, and data clocking.

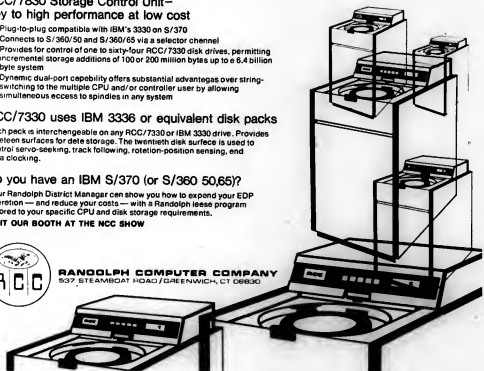
Do you have an IBM S/370 (or S/360 50,65)?

Your Randolph District Manager can show you how to expand your EDP operation — and reduce your costs — with a Randolph lease program tailored to your specific CPU and disk storage requirements.

VISIT OUR BOOTH AT THE NCC SHOW



RANDOLPH COMPUTER COMPANY  
837 STEAMBOAT ROAD GREENWICH, CT 06630



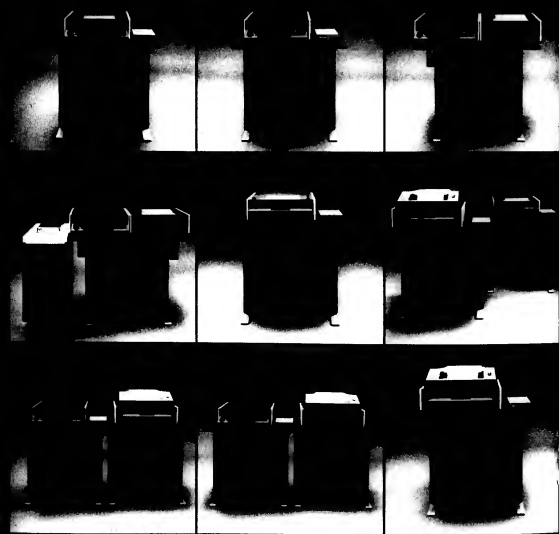
**BELL  
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TO-END**



Bell offers a new network for Data.

**BELL IS DATA**





**S DATA**



### Technical Specifications:

# END-TO



O-END



**END-TO-END**



**Bell offers unequalled testing and maintenance.**

**Testing.**

At Bell, we have the most sophisticated testing equipment in the world. We use it to find out exactly what's going on inside your telephone system.

Our tests are so accurate that we can find out exactly what's going on inside your telephone system. We can find out exactly what's going on inside your telephone system.

Our tests are so accurate that we can find out exactly what's going on inside your telephone system. We can find out exactly what's going on inside your telephone system.

Our tests are so accurate that we can find out exactly what's going on inside your telephone system. We can find out exactly what's going on inside your telephone system.

**Maintenance.**

At Bell, we have the most sophisticated maintenance equipment in the world. We use it to find out exactly what's going on inside your telephone system.

Our tests are so accurate that we can find out exactly what's going on inside your telephone system. We can find out exactly what's going on inside your telephone system.

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Our tests are so accurate that we can find out exactly what's going on inside your telephone system. We can find out exactly what's going on inside your telephone system.

**Who knows more about telecommunications  
than the telephone company.**





Basic Timesharing Model BT1 4000

## Can Serve 256 Users

## BSI Showing Interactive T/S Unit

ANAHEIM, Calif. — The BT1 4000 minicomputer-based interactive timesharing system will be featured in the Basic Timesharing booth, 1221.

The system clusters units so the workload is shared between a system's central processors and disk storage facilities, permitting a system with eight processors to serve up to as many as 256 concurrent users. Disk storage is expandable to more than 4 billion bytes online, the firm said.

There are three models in the line — the 4000/10, 4000/20 and 4000/30 — differentiated by the type of disk controller and disk capacity, with the smallest permitting up to 10M bytes per controller in 2.4M-byte increments; the middle model expandable to 295M bytes per controller in 36M-byte increments and the largest expandable to 590M bytes per controller in 73M-byte increments.

## Recortec Introducing Computer Tape Copier

ANAHEIM, Calif. — The Recortec computer tape copier — which will be introduced in booths 1304 and 1306 — was designed to duplicate 1,600 char./in. phase-encoded tapes.

Fewer than 10 minutes are required to copy and verify a full 2,400-ft reel, the firm said, adding that this could permit users to never take original tapes out of the tape library area.

The system also allows library personnel to write headers, verify incoming data tapes or archival tapes while cleaning them and clean and evaluate scratch tapes, the firm said.

The computer tape copier, which uses two high-performance tape drives, is priced at \$24,750, according to Recortec, Inc. at 777 Palomar Ave., Sunnyvale, Calif. 94086.

## Interdata Bringing 8/32 To Highlight Its Exhibit

ANAHEIM, Calif. — The recently announced 8/32 minicomputer will be the highlight of the Interdata display in booth 2337.

The system features 32-bit architecture with up to 1M bytes of directly addressable memory, an effective cycle time of 450 nsec and a 240 nsec processor cycle time, in addition to floating-point hardware.

The firm will also be displaying its 30 char./sec Carousel serial impact printer, which features microprocessor control and digital stepper motors, and the 71/6 minicomputer system, the firm said from 2 Crescent Place, Oceanport, N.J. 07757.

## National Semi Sending Pace

ANAHEIM, Calif. — A working exhibit of the Pace microprocessor, as well as a static display of add-on memory systems for the IBM 370/145 and 158, will highlight the National Semiconductor display in booths 2305 and 2307, according to the firm at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

A minimum configuration is priced at \$55,000, while a 4000/30 with 32 ports and 146M bytes of storage would run \$101,000, the firm said from 650 N. Mary Ave., Sunnyvale, Calif. 94086.

## One With Microprocessor

## Datatype Page Readers to Debut

ANAHEIM, Calif. — Datatype Corp. will show its Model 400 and Model 500 optical page readers in booth 2652 along with a new typing element for IBM Selectric typewriters.

The Model 400 reads at 110 char./sec and does not use mechanical clutches and brakes for advancing paper through the machine, thereby cutting maintenance, the firm claimed.

The Model 500 is a Model 400 with a microprocessor added, giving the device 45 generalized computer instructions that can be tailored to individual applications, the firm said.

The microprocessor's memory provides the capability to output any coding format, the firm said, and programmable groups of characters are stored in the memory for outputting of commonly used messages and control codes.

## Miniworld

At  
NCC



Almost any CRT terminal can be connected to the unit, the firm said, permitting a variety of different modes.

The new DF-6 typing element prints a mark under each character which can be read by the Datatype 506 reader, the firm said from 1050 N.W. 163rd Drive, Miami, Fla. 33169.

# With this hanger...

# and this rack...

# and any hanging tape you use...



## Tab presents the most versatile tape storage yet devised!

We call it Tab Hang II.\* That's because this compact, new concept in hanging tape storage accommodates any type seal or cartridge with a hook in use today — and, for that matter, probably any in store for the future!

### Spring loaded, plastic-against-plastic.

Basically, the system consists of a rack with polypropylene hangers that can be used in open, mass library storage, or in our Data Media Cabinets. The plastic hangers exert a spring-loaded effect

on the tapes — a tap of the finger swings a tape out so it is easy to grasp. The system allows side-to-side movement of the hangers, accommodating the varying widths of hanging tapes.

The plastic hook on your tape mates with the plastic hanger, eliminating metal-to-plastic abrasion. Tab's new Hang II, a hanging tape storage system for all seasons!

Call your local Tab Products representative or write for information. Tab Products Company, 2660 Hanover Street, Palo Alto, California 94304.

NCC Booth #2635-2639

**TAB**  
PRODUCTS CO

## Kennedy Schedules First-Time Display Of 9100 Transport

ANAHEIM, Calif. — A first-time showing of its Model 9100 Tape Transport is planned by Kennedy Co. in booth 2117. The 10-1/2-in. red, 75 in./sec vacuum-column tape transport uses a capacitive tape location detector to reduce tape wear and improve recording accuracy. The transport reads and writes IBM- and ANSI-compatible tapes. Typical applications are minicomputer and data collection systems.

**Metallized Diaphragm**  
To provide linear tape position sensing, a metallized Mylar diaphragm serves as one plate of a variable capacitor which extends the complete length of the rear of the vacuum column. Pumping at the bottom of the column produces a negative 1 psi pressure below the tape and a negative



Kennedy Model 9100 Tape Transport

1/2 psi pressure above the tape. The differential pressure displaces the diaphragm in proportion to tape location and provides a linear variable capacitance output.

The transport has a standard tape speed of 75 in./sec with speeds from 25- to 75 in./sec available on special order. The unit comes in 800 bit/in. or 1,600 bit/in. models, Kennedy said from 540 West Woodbury Road, Altadena, Calif. 91001.

## Hydra to Show OEM Printer Line

ANAHEIM, Calif. — Hydra Corp. will introduce a series of OEM medium-speed printers in booth 2710.

The first in the line is the Model B, a 180 char./sec matrix printer.

The Hydra ballistic print head, unlike other matrix printers, does not use solenoids with moving cores attached to the wires, the firm said. It uses simple electromagnets that activate small hammers which, in turn, ballistically propel the matrix wires.

### Small Circle

With the wires independent of the coils, the driving ends are engaged in a small, centrally located circle.

The character style of the Hydra printer is a 9 by 7 dot matrix, for a total of 63 dots available for each character formation. Two of the nine wires are below the nominal print line, permitting the printing of both upper- and lower-case English characters, as well as foreign alphabets such as German, Arabic and Japanese

Kana, the firm said from 2218 Old Middlefield Way, Mountain View, Calif. 94043.

## Randomex to Exhibit Four Disk Cleaners

ANAHEIM, Calif. — Four disk cleaners will be shown in booth 1455 by Randomex, Inc., with particular attention on the 515 and 535 disk cartridge cleaners, which are said to be capable of cleaning over 95% of the disk cartridges presently in use.

The 535 is for cleaning the IBM 5440-type cartridge among others, the firm said, noting that both it and the 515 permit cleaning without dismantling of the cartridge's plastic case.

The firm is at 27303 Warrior Drive, Palos Verdes Peninsula, Calif. 90274.

## Miniworld

At  
NCC



## PDI Announces Entry Of 1000 Card Reader

ANAHEIM, Calif. — The Model 1000 card reader, which is Peripheral Dynamics, Inc.'s entry into the data collection field, will be featured in booth 2250, the firm said.

The unit is a single feed card reader designed to handle 22-column, 51-column and 80-column cards, the firm said, adding that it will cost \$600 in single quantities.

Peripheral Dynamics is at 1030 W. Germantown Pike, Norristown, Pa. 19401.

## Systems Will Demonstrate SAC Graf/Pen, Coupler

ANAHEIM, Calif. — A variety of systems featuring the Graf/Pen series digitizer and the Model DC-6 data communications coupler will be in operation at Science Accessories Corp.'s (SAC) exhibit in booths 1250 and 1252.

The systems to be demonstrated include a business data entry system, a strip chart analysis system, a system for interaction with a plasma display and a biomedical system for ventricular volume analysis.

For strip chart analysis, the firm will utilize its Model V-3 motorized chart viewer on which the Graf/Pen sensors are mounted. Curves traced by the Graf/Pen stylus will be converted into digital coordinates by the Graf/Pen and then into punched paper tape by a punch incorporated in the system, according to the firm at Kings Highway West, Southport, Conn. 06490.

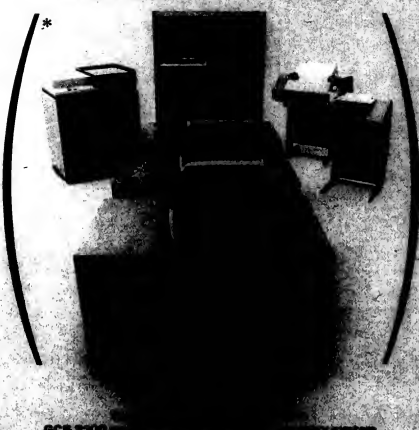
### Printntronix 300 to Be on View

ANAHEIM, Calif. — Printntronix, Inc. will display the Printntronix 300, a recently introduced, 300 line/min multiplicity matrix printer in booth 1358.

Individual dots are overlapped to give the appearance of a solid font while providing the capability of precise character alignment available in a device of this type, the firm said.

Designed to meet the requirements of the expanding minicomputer systems market, the unit's price, including an interface compatible with existing printers and an electronic VFL, is \$4,695 in single quantities, the firm said from 17935 Sky Park Circle, Irvine, Calif. 92707.

# GREAT COMPUTER SECRETS



GCS 2100

System

## Telefile to Launch First Voyage Of Its DC-16-C Disk Controller

ANAHEIM, Calif. — A disk controller will be introduced by Telefile Computer Products, Inc. in booths 1111 and 1113. The DC-16-C will be offered along with a tray of five Telefile disk drives, enabling the creation of a disk storage system with a capacity of 27.3M bytes to 640M bytes.

The system can be used with the Control Data Corp. 1700 Series; the Digital

Equipment Corp. PDP-11; the Honeywell H-16; the Hewlett-Packard 2100 series; the Interdata 50, 70, 74, 80, 85, 7/16, 7/32 and 8/32; the Lockheed Sea and Mac 16; the Data General Nova 800 and 1200; and the Varian V-70 series.

### Handles Four Drives

Priced at \$5,500 more controller, a system can cost under \$11,000, the firm said.

The unit can handle up to four disk drives in the standard configuration, but an option allows it to go to eight drives while the data transfer rate is either 800 kbytes/sec or 1,209 kbytes/sec.

There are nine operational commands and two status registers with the system, Telefile said from 17131 Damlar St., Irvine, Calif. 92705.

## Facit-Addo Showing Printer

ANAHEIM, Calif. — Facit-Addo, Inc. plans to show its Model 4554 serial page printer with a printing speed of 60 char./sec at each of its exhibit in booths 2734, 2736 and 2738.

The unit is available with parallel interface or serial interface, the firm said from its headquarters at 501 Winsor Drive, Seacrest, N.J. 07094.

For the past four years we've been developing our powerful GCS 2100 system and building its software support and service program. And we've never taken the time to tell enough people what a great system it is. How efficient it is (averaging 85% reduction in errors—35% to 85% faster document handling).

How reliable it is (less than 1% downtime). How simple it is (operator training time less than 8 hours).

Or how economical it is (10%—40% savings in data preparation costs).

And our competitors have loved us for keeping it such a secret!

**The GCS 2100 is a complete data entry system:** it lets you collect and edit data at the source (data is actually edited while it is being keyed).

Store the data on disc. Then transfer the clean data to an output media like magnetic tape.

(Conversely, data already on tape or cards can be re-submitted to the GCS 2100 for editing, reformatting, etc.)

By editing input data before it goes to disc storage, the GCS 2100 lets you quickly spot errors that could have become costly.

The GCS 2100 can interface up to thirty-two Touch-Tone® telephones. Card readers. Medium and high speed line printers. Four-tape drives. Four fixed or moving head discs.

All on a single system.

The GCS 2100 provides extensive I/O functions that allow you to transfer data to and from disc storage and other I/O devices, and provides an audit trail (comprehensive statistical reports aid in monitoring the system and the operator's performance), all with minimum impact on a supervisor's time.

**The GCS 2100 can accommodate up to 64 local or remote terminals:** local terminals can be located up to 2500 ft. from the system's CPU. You get faster, more accurate data entry for functions like payroll, shipping, receiving and manufacturing, because the person most familiar with the data does the keying. (Note: we can supply a typewriter keyboard and a special CRT format so this person doesn't have to be a keypunch operator.)

In addition to data entry from local terminals, the GCS 2100 offers data entry from remote terminals (it can handle up to five remote terminals over one dedicated telephone line). Touch-Tone® data entry, remote batch communications; and word processing.

## Miniworld At NCC



### Talos Unveiling Two Cursors

ANAHEIM, Calif. — Talos Systems, Inc. will unveil one, and four-button cursors for its Cybergraphic digitizer line in booths 1350 and 1352.

A magnification option is available for close work. Both models come with a hard anodized black finish and are directly interchangeable with stylus or pen assemblies in Talos' Cybergraphic tablet and digitizer systems.

Price for the one-button cursor is \$200 and \$250 for the four-button model, the firm said from 7311 E. Evans Road, Scottsdale, Ariz. 85260.

## Dataram Corp. Plans To Raise the Curtain On Five Memory Units

ANAHEIM, Calif. — A 32K by 20 bit single-board memory and four 16K single-board memory systems will be introduced by Dataram Corp. in booths 1260 and 1262.

The DB-32K system features 750 nsec cycle time and 300 nsec access time, the firm said, adding that the unit would be priced at less than \$5 cent/bit.

The four 16K-bit systems offer expansion memory for the Data General Nova 2 series, the Digital Equipment Corp. PDP-8 and PDP-11 and Interdata's models 50, 70, 7/16 and 7/32 minicomputers.

The single-board systems are designed to plug in directly with the host systems, the firm said from Princeton-Hightstown Road, Cranbury, N.J. 08512.

## Total Eclipse

ANAHEIM, Calif. — Data General (DG) will feature the theme "interactive systems" with an all-Eclipse exhibit in booth 1355.

The first of three systems on display will be the Eclipse C/300 commercial system, operating with Infox data base-oriented file management software.

In addition, an Eclipse S/200 will be demonstrated as a JSP workstation and a second Eclipse S/200 will be seen controlling a real-time sensor-based operation.

## Printer With Options To Star at Okidata

ANAHEIM, Calif. — An expanded version of the Okidata Corp. 110 char./sec printer and an alphanumeric model display will be shown in booth 2629 by Okidata.

The newest model of the CP110 printer features optional tractor and upper and lower-case ASCII characters. The unit produces 80 columns of 5 by 7 dot matrix characters at 110 char./sec or 70 line/min and costs less than \$900 in OEM quantities.

The panel display is an alphanumeric display in green, in addition to the firm's previous read display.

The firm will also show its line of double-density disk memories with capacities up to 36M bits and its line of card readers that operate at speeds of 300, 450 and 600 card/min. Okidata said from 111 Gathier Drive, Moorestown, N.J. 08057.

## Tennecomp Datapacer Set

ANAHEIM, Calif. — Tennecomp Systems, Inc. will show its Datapacer cartridge tape system, which is compatible with the Digital Equipment Corp. PDP-8 and PDP-11, in booth 2451.

The unit uses the 3M cartridge and can store 2.8M bytes per 4-track cartridge. Three drives are contained in a 19-in. rack.

The unit reads and writes at 30 in./sec with a transfer rate of 48 kbytes/sec while searches are done at 90 in./sec. DEC-compatible software is available with the system, Tennecomp said from 795 Oak Ridge Turnpike, Oak Ridge, Tenn. 37830.

## Perforator Mechanisms on Display

ANAHEIM, Calif. — The EP series perforator mechanism will be displayed for the first time in booth 2265, according to its vendor, Data Specialties, Inc.

The unit has a die block life of 120M characters or 1,000 rolls, the firm said, and operates up to 30 char./sec asynchronous.

The firm is at 1548 Old Skokie Road, Highland Park, Ill. 60035.

### A Programmable Extension Package (PEP) extends the power and the flexibility of the 2100 system:

up to 255 PEP tables provide capabilities like automatic data insertions; range and value checks; table look-ups; logical tests; character expansion (the operator keys S.D., South Dakota is generated on output); and automatic format switching.

And because these tables are not job assigned, they can be used on several different jobs. (Note: no programming experience is needed to work with PEP.)

A library of over 100 special edits is also available. It handles things like field relocation; special balancing routines; manipulation of constants; and output editing requirements. (If there isn't an edit for your needs, we can design one.)

The GCS 2100 also provides up to 99 format levels per job; up to 255 balance accumulators; variable length record and blocking factors; and up to 255 jobs stored in the system.

**GCS DataTel:** provides remote batch communications capabilities between the GCS 2100 systems and other 2780-compatible terminals and mainframes. And since the batch transmission of data is directly from disc to another mainframe, the usual stage of transferring data to tape can be eliminated.

**GCS DataTone:** is a low-cost, efficient and convenient method for collecting numeric data from remote sites. It is designed for updating inventory, shipping documents, orders, etc.

DataTone answers automatically and handles up to thirty-two incoming lines at once.

With DataTone, the GCS 2100 system can accept incoming telephone data without interrupting data entry from the terminals.

**GCS DataText:** is a multi-purpose shared-processor approach to word processing. Designed for high-volume typing requirements, it is a fast, efficient, low-cost method for producing customized letters, envelopes, forms, labels and reports.

And since DataText uses a disc library, manual handling of storage media like cards, cartridges, etc., is eliminated.

If you'd like to get in on more Great Computer Secrets, contact Agents 2100 at General Computer Systems, Inc., 18600 Cooley Road, Addison, Texas 75001. (800) 527-2568 toll free. In Texas (214) 233-5800.

**GCS 2100**  
GENERAL COMPUTER SYSTEMS, INC.

## ASC Display to Use Intel 8080 In Controller, Microprocessor

ANAHEIM, Calif. — Two products using the Intel 8080 microprocessor will be displayed by Applied Systems Corp. (ASC) in booth 2391.

### The ASC communications controller Time Code Generator Model Planned for Datum Exhibit

ANAHEIM, Calif. — A ruggedized time code generator (the Model 9150-406) will highlight the Datum, Inc. exhibit in booth 2316.

The device generates a serial time code format for tape recorder input, serial pulse train for system clock and sync pulses, and parallel data for digital system requirements, according to the firm at 1363 S. State College Blvd., 92806.

uses the microprocessor configured with multiple interrupts to control one or more terminal devices. The unit communicates at rates up to 9,600 bit/sec.

A binary synchronous communications option is available to allow communication with IBM BSC systems using RS-232C compatible modems. The data transmission conventions may employ Ascii, Ebcidic, transparency or conversational modes, the firm said.

The ASC ruggedized microprocessors, offered for custom implementation, was designed for severe environments. The unit features field-reprogrammable read-only memory and compatible random access memory for laboratory and airborne applications, the firm said from 26401 Harper Ave., St. Clair Shores, Mich. 48081.

## Timeplex Modem on Stage

ANAHEIM, Calif. — A modem compatible with Bell 202 data sets which features a digital filter system will be exhibited by Timeplex, Inc. in booth 2620.

The digital technique is said to improve performance at 600- and 1,200 bit/sec and permit communications between 202s at 1,800 bit/sec over unconditioned or switched network lines or at 2,000 bit/sec over C2-conditioned private lines, the firm said.

Among the available options — all field-installable — are a synchronizer for synchronous data transmission, a

5- or 150 bit/sec reverse channel, a four-wire polling system, remote backup module and a direct switched-network interface (tariff permitting).

The Timeplex 202-Compatible Modem is available either as a single stand-alone unit in a small cabinet with integral power supply or as a card for insertion in an enclosed rack which holds up to 26 modems (Bell 103s, 202s or calling units) with either single or redundant power supply. Prices start at \$205, the firm said from 214 Franklin Ave., Midland Park, N.J. 07432.

## ICP to Announce Three Products

ANAHEIM, Calif. — International Computer Products, Inc. will announce three new products in booth 1133.

The Baudverter converts from 110- to 300 bit/sec to 1,200 bit/sec and up, the

firm said, by storing data for high-speed transmission from low-speed terminals. The unit is priced at \$144.

An all-weather point-of-sale device to capture data on a cassette tape, the V-71, can be vehicular-mounted or portable, the firm said, adding that each cassette could typically handle 6,000 data transactions. The unit is priced at \$1,195.

The final product is the P1-71 digital

## Shukan opens the door to the ever-expanding Japanese market.

The burgeoning Japanese computer market is the place to be, and Shukan Computer is the advertising vehicle to get you there. Japan is the second largest EDP market in the world, and the fastest growing. And according to the U.S. Department of Commerce, Japanese imports of EDP equipment will grow at a rate of 30% annually through 1977, when total imports will exceed \$1 billion per year. The U.S. share of this market should remain constant at 55%, although in previous years the U.S. share has reached as high as 70%. The minicomputer market is expected to chart a phenomenal 60% annual growth rate through 1977, while independent peripheral equipment sales will rise at a 44% rate. And the market potential for U.S.-manufactured communications terminals is great, according to the U.S. Department of Commerce, because the U.S. equipment is technologically superior to that being manufactured in Japan.

Shukan Computer, Computerworld's sister publication in Japan, is a joint venture of Computerworld and the leading electronics publisher in Japan, Dempa Publications. Shukan is the only newsworthy for the computer community in Japan and with the combined resources of the two companies, it has the largest news gathering organization of its kind in the world.

Japanese businessmen read more than their American counterparts, and they place a greater value on the advertising they read. Buying decisions in Japan — unlike the common American system of one man, "EDP Manager" control — are reached through development of consensus between several levels of operating management, including programmer and analyst levels. And Shukan goes to all these important buying influences. 23.5% of total circulation goes to Data Processing Management, 12.5% to Corporate Executives, and 27.9% goes to Professional Staff in the computer industry.

It's easy to advertise in Shukan. For a small surcharge, Shukan will translate your ad from English, set type, prepare a new mechanical and make a plate (rotary letterpress production). And with Computerworld representatives across the U.S. to assist you, you needn't go further than contact your area Computerworld salesman to place space in Shukan.

### Free Market Report

If you'd like to know more about the Japanese market, we'll be glad to send you a free copy of our report "EDP Marketing in Japan". Just send in the coupon below — or contact your Computerworld representative.

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Computerworld  
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## Terminals

At  
NCC



cassette tape deck that operates in asynchronous incremental mode at 0- to 75 byte/sec and at 0- to 40 byte/sec in the synchronous incremental mode.

In the synchronous block mode, the unit operates at 100 byte/sec for a price of \$340, and electronically switched read/write models, according to the firm at P.O. Box 34484, Dallas, Texas 75234.

## Pertec Transports Get First Showing

ANAHEIM, Calif. — The Peripheral Equipment Division of Pertec Corp. will exhibit for the first time its recently announced T9000 series vacuum column tape transports in booth 1429.

The Pertec T9000 is a 10-1/2-in. reel transport that is IBM- and Ansicompatible. It is available in a full range of standard models with tape speeds from 25 to 75 in./sec and data transfer rates up to 120K char./sec.

Standard configurations for the T9000 series tape drives include 7- or 9-track NRZI, 1,600 char./in. phase-encoded (PE), an optional electronically switched dual format NRZI/PE and special multidensity read-only models.

A 3-in.-wide vacuum column which uses a low-speed vacuum pump and a "baffled" enclosure around the pump results in quiet operation and extended life, the firm said from 9600 Ironton Ave., Chatsworth, Calif. 91311.

### Telenet Will Demonstrate Packet-Switched Service

ANAHEIM, Calif. — Telenet Communications Corp., a specialized common carrier, will demonstrate its first public packet-switched data communications service in booth 1205.

Nationwide service will initially be available from packet-switching exchanges installed in Washington, D.C., New York City, Boston, Chicago, Dallas, San Francisco and Los Angeles, the firm said from 1666 K St. N.W., Washington, D.C. 20006.



## 8800 'Super Disk,' Mag Tape Subsystems Part of STC Exhibit

ANAHEIM, Calif. — Storage Technology Corp. (STC) will exhibit equipment from its 8000 series disk family and its 3400 and 3600 series of magnetic tape subsystems in both 1129.

The 8800 Super Disk module has a storage capacity of 800M bytes. The disk's storage media is fixed and consists of four disk packs, the quad pack. It is accessed by the arc actuator — a central shaft controlling multiple arms and heads.

The module is program-compatible with IBM 3330 software.

STC's single-spindle 8100 disk module, which uses a removable disk pack equivalent to the 3336-1, will also be featured.

The 8000 disk control unit and the 8001 control module, required for attaching the single-spindle modules, will also be shown.

Tape products on display will include the Model 3470 and 3670 tape drives.

The 3470 records at 1,600 bit/in. and



STC Model 3670 Tape Drive Unit

the 3670 records at 6,250 bit/in.

STC's 3800-IV control unit, which operates in group-coded recording mode at 6,250 byte/in. or phase-encoded mode at 1,600 byte/in., will also be on display. The company is at 2270 South 88th St., Louisville, Col. 80027.

## Japan Vendor Flying in Drives

ANAHEIM, Calif. — Nippon Peripherals Ltd. will display its Model NP210 disk drive and Model NP 21 data module in booths 1153 and 1155.

Random access memory units, the NP20 and NP21 are said to be plug-compatible with IBM 3340 drives and 3348 modules respectively.



Nippon Peripherals Drive Unit

The vendor noted diagnostics on the disk drives are accomplished by inserting a microprogram in the controller. The data module is closed, accommodating the disk, head, carriage and spindle, the company added.

Currently available for OEM sales in the overseas market, the devices can be obtained from Nippon at 2039-93 Okuda Building, Kugenuma, Fujisawa-shi, Kanagawa-ken, 251 Japan.

## CRU Meter to Make Showing

ANAHEIM, Calif. — CRU, a subsidiary of Computer Resources, Inc., will demonstrate its capacity meter in booth 2263.

The unit, designed for IBM 370/135 and up computer systems, is a measurement device that signals when a system falls below predetermined loading levels.

The unit is priced at \$4,500, the firm said from 4650 W. 160th St., Cleveland, Ohio 44135.

...On  
to  
NCC



## T/S Plotter Controller To Highlight HI Booth

ANAHEIM, Calif. — A time-sharing plotter controller and a magnetic tape controller will be the highlights of the Houston Instrument display in booth 2717.

The PTC-5 plotter-controller drives any Complot plotter, the firm said, adding that the unit has firmware character, vector generation and a circular buffering system.

The MTR series of phase-encoded tape reader controllers operate at 1,600 char./in. and range in price from \$16,750 to \$19,950, the firm said.

In addition, Houston will display the DP-1H plotter which is said to be 50% faster than the DP-1. It plots at 450 step/sec and operates on-line or off-line for a price of \$3,500, the firm said from One Houston Square, 8500 Cameron Road, Austin, Tex. 78753.

## 700 Line/Min Chain Printer

### For S/3 Prime DAC Feature

ANAHEIM, Calif. — A feature of the Digital Associates Corp. exhibit in booth 1665 will be the 700 line/min chain printer now being delivered to IBM System/3 users.

The unit features a full 48-character IBM-compatible chain, heavy duty paper tractors above and below the print station, as well as built-in test circuits and a LED diagnostic panel.

This unit is offered for sale at a purchase price of \$25,600 or \$675/mo on a three-year lease. Digital Associates is at 24 Old Kings Highway South, Darien, Conn. 06820.

## PPI Power Converter to Debut

ANAHEIM, Calif. — A solid-state power frequency converter will be introduced by Programmed Power, Inc. in booths 1211 and 1213.

The system 475 is for applications requiring 400 Hz power and the maximum power is 75 KVA, the firm said from 141 Jefferson Drive, Menlo Park, Calif. 94025.

# Model 204

Database Management Software System

Model 204 is a powerful, flexible, and easy-to-use database management software system. It is designed to handle a wide variety of data processing tasks, from simple file management to complex database operations. The system is built on a modular architecture, allowing users to tailor the software to their specific needs. Key features include:

- Data Compression:** Efficiently stores and retrieves data, reducing storage requirements.
- User Language:** A simple, intuitive language for defining and manipulating data.
- Security:** Robust security features to protect data from unauthorized access.
- Flexibility:** Supports a wide range of hardware and operating environments.
- Performance:** Optimized for fast data processing and retrieval.

# With 90 Sessions in 18 Areas in Four Days...

ANAHEIM, Calif. — The 1975 National Computer Conference session coverage has been broadened to include sessions falling under the category of "Interaction With Society," in addition to the previous topics of "DP Methods and Applications" and "Science and Technology."

Conference chairman Donald A. Meier and technical program chairman Stephen W. Miller have planned the schedule to enable attendees to attend consecutive, rather than concurrent, sessions in their area of interest in the same location at the convention center here.

The four-day conference, beginning May 19 and ending May 22, will feature 90 sessions in 18 areas, as well as several special events.

Areas identified under the topic of "Interaction With Society" include "Education-Curricula-Training," "Making Computers Safer," "Legal Aspects of Computer Management" and "International Dialogue."

In the science and technology area, special emphasis will be placed on the impact of recent or expected breakthroughs on management controls, operational systems and cost-effective computer usage.

Science and technology will encompass sessions in eight areas ranging from micro-

processors to software, storage technology and forecasting DP.

"Methods and Applications" will center on analysis of the cost effectiveness of a system or portions thereof, focusing on topics of concern to management.

The six areas grouped under the heading of "Methods and Applications" will range from user views and requirements to management, health care, banking and "innovative" applications.

Of the 15 sessions in the overall area of "Interaction With Society," four of Tuesday's sessions on education will examine whether education is meeting industry's needs, with views from both sides, as well as a look at how programs benefit from interaction and cooperation.

Two other sessions will treat DP education for students majoring in other subjects as well as computer-assisted instruction.

Also on Tuesday, four sessions will examine "Making Computers Safer" through technology, licensing and other alternative methods, good practices and auditing.

On Wednesday, attendees interested in "Legal Aspects of Computer Management" will hear speakers cover aspects ranging from legal responsibilities in buy-

ing, using and selling DP equipment to antitrust and regulatory aspects, as well as possible changes that may occur in order for law to meet the needs of the computer era.

The Wednesday sessions on international dialogue will center on communications such as packet switching and interface standards.

An overview of special events appears on Page 64.

Under the aegis of "Methods and Applications," several sessions will focus on user needs and views.

Two sessions on user requirements will present the two sides of the issue, both user and turnkey system development, followed by a panel of users and manufacturers addressing the issue of technology transfer.

The four sessions on users' viewpoints on DP will highlight sound management controls and procedures and data security and privacy.

Attendees will hear discussions on optimizing the computer installation, data security and personal privacy, managing new programming technologies and selecting data base management packages.

The four Wednesday sessions on health care and computers will feature a look back at what went wrong with medical information systems, as well as a look forward to future directions in medical computing.

There will also be sessions on computer applications in ambulatory care as well as medical information systems.

Tuesday's banking sessions will cover topics ranging from electronic funds transfer systems to back-office problems and approaches to solutions. Other aspects of technology as applied to banking, such as communications-based systems and data bases, will also be examined in depth.

Under the heading "Management and Computers," two sessions will deal with the perspective of a DP executive and a user executive, while a third will look at management issues in computers—such as long-range planning and cost benefit evaluation of interactive transaction processing.

Sessions coming under the heading of "Innovative Applications" will cover areas such as medicine, education, automation and "knowledge-based expert systems," which are defined as those hav-

(Continued on Page 51)

	MONDAY afternoon		TUESDAY morning		TUESDAY afternoon		WEDNESDAY
	2:00 p.m.-3:40 p.m.	3:50 p.m.-5:30 p.m.	8:15 a.m.-9:55 a.m.	10:05 a.m.-11:45 a.m.	2:00 p.m.-3:40 p.m.	3:50 p.m.-5:30 p.m.	8:15 a.m.-9:55 a.m.
Santa Ana Room	1. National Centers for Scientific Computing — G. Stuart Patterson Jr.	6. Alphas Programs — Paul W. Bernbaum	11. Microprocessor Basics — Rob Walker	17. Microprocessors at Work — Paul M. Russo	23. Bipolar Microprocessors — Theodore A. Lelios	29. Microprogramming and Microcomputer Programming — Harut Barsamian	37. Tutorial and Panel Discussion on Relational Data Base Management — Edgar F. Codd
Calif. Room I	2. Programming as an Act of Communication — Robert Barton	7. Software — Portability and Reliability — David B. Worman	12. Programming — Art, Science or Engineering? — Brian W. Kernighan	18. Issues in Programming Language Design — Anthony J. Wasserman	24. Cobol '74 — Its Impact on Software Engineering — Paul Oliver	30. Software Engineering — Thomas E. Bell	38. Operating Systems Theory — R. Stockton Gaines
Garden Grove Room	3. Graphic Models of Physical Systems — Charles M. Eastman	8. Economics of Computer Graphics Systems — Ira W. Cotton	13. Electronic Funds Transfer Systems: What's In It for You? — B. Ray Trawick	19. Implications and Applications of Communications Based Systems Technology on Banking Operations — Larry Dorf	25. Banking's "Back Office" Paper Problems and Approaches to Solutions — Watson M. McKee Jr.	31. Data Base Technology in the Banking Industry — Bernard K. Pagan	39. Optimizing the Computer Installation — Lee J. Cohen
Calif. Room II			14. Making Computers Safer Through Technology — Eldred Nelson	20. Making Computers Safer Through Licensing, Certification or Professional Responsibility — Oliver R. Smoot	26. Making Computers Safer Through Good Practices — Bruce Glickert	32. Making Computers Safer Through Auditing — William E. Parry	40. Legal Responsibilities in Buying, Using and Selling Data Processing — Robert P. Bigelow
Calif. Room III	4. Developer and User View of User Requirements — Richard G. Mills	9. Technology Transfer: A Smouldering National Issue — Richard G. Mills	15. Future Prospects in Data Processing-I — Earl C. Joseph	21. Future Prospects in Data Processing-II — Orrin E. Taubee	27. Future Prospects in Data Processing-III — Stephen Fries	33. Advances in Computer Technology Through Aerospace Requirements — Richard H. Thayer	41. Enhancing Storage Reliability by Sophisticated Coding Schemes — Jack Moshman
Calif. Room IV	5. Information Processing: Its Impact Upon Society Through Library Systems — Susan Crowe	10. Computing Applied to Societal Problems — Donald L. Thomson Jr.	16. Data Processing — A View from Education — A Reaction from Industry — Thomas J. Carham/Gary B. Shultz	22. Graduates and Undergraduates Programs in Computer Science — Barry L. Bateman	28. Computer Education for a Computerized Age — Julius A. Archibald Jr.	34. Use of Computers in Instruction — Sylvie Chapp	42. Public Packet-Switching Status Report — Vinton Cerf
Anaheim Room	KEYNOTE ADDRESS 10:00 a.m. — Anaheim Room Speaker: Prof. Jay W. Forrester, MIT		CONFERENCE LUNCHEON 12:00 p.m.-1:45 p.m. — Anaheim Room Speaker: Neil Gorchane, Sperry Univac		35. SPECIAL SESSION 8:00 p.m.-10:30 p.m. — California Room I The Editors Speak Out, Herb Wiener		43. What Went Wrong With Medical Information Systems: An Optimistic Outlook — Jan F. Brondyk





# Announcing the start of a new era in business computing.

## The DATASYSTEM 310 from Digital. A disk-based computer system for \$12,000.

Datasystem 310. One of the most remarkable business tools Digital or anyone else has ever designed.

Now you can own a disk-based computer system at a price that seems all but impossible. \$12,000 purchased. Under \$300. a month leased.

So warehouses, insurance companies, large EDP users, banks, and companies with many branch offices may find the 310 the most important new system in years.

It includes a PDP-8A CPU with 16K characters of core memory, a VT50 CRT (960 character display) with full keyboard and numeric keypad, operating software, and a dual floppy-disk drive to store 670,000 characters.

You can expand up to 64K characters of memory and up to 1.34 million characters of disk storage. You can add printers with speeds of 30 cps, 165 cps, or 300 lpm; and a 2780-compatible interface for communications.

COS 310 software provides tools to develop and run an efficient system. DIBOL language serves for higher-level business

programming, and a full complement of utility routines can handle file management and report generation.

To some users it will be the ideal RJE station. To others it will be a brilliant terminal at a cost lower than a smart one. For still others it will be the stand-alone computer system that goes anywhere. And whatever applications programs you develop for the 310, you develop only once. Since these programs will run on your other 310's or larger 300 series systems without reprogramming.

For all of these reasons it was designed to be bought by the dozens. Which is made easier by our volume discounts. It's a computer that costs less than most terminals, less than most calculators, less than most clerks. And it's complete. And completely backed up by Digital — manufacturer of the most, as well as the most reliable, minicomputers in the world.

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## In Addition to Micro Modem

# DTC Printer-Based Terminal Plans First Appearance

ANAHEIM, Calif. — Several new products — ranging from a table-top printer-based terminal through a modem to a floppy disk communications system — will be announced by Data Terminals and Communications (DTC) in booth 2449 here.

The DTC-300 Model T table-top, 30 char./sec, Diablo print-

er-based terminal incorporates a read-only memory to control left and right margins, vertical tab set and reset, bidirectional printing, graphics capabilities, super plot and variable pitch and line-feed spacing.

The features may be controlled from the Selectric-style keyboard or the communications line using standard Ascii escape and control codes, the firm said, adding that the unit is priced at

\$134/mo or \$4,500 purchase.

The firm's micro modem is said to be compatible with all available data couplers including the Bell 113 A and B, the Bell 103 A and F, data phones and so forth. The unit ranges in price from \$75 to \$250, the firm said.

The Micro-File flexible disk storage and edit system can be attached to any Ascii terminal to permit off-line data entry editing, storage and retrieval. The

unit is capable of transmitting from the terminal at up to 4,800 bit/sec.

Incorporating the Shugart floppy disk, the system allows for storage and retrieval of data by file or line identification and average access time is said to be 5 sec/record.

Priced at less than \$3,000, the unit is available from the firm at 1190 Dell Ave., Campbell, Calif. 95008.



DTC Micro Modem

## Six AJ Devices To Make Debut

ANAHEIM, Calif. — Three terminals and three acoustic couplers will highlight the Anderson Jacobson, Inc. exhibit here in booth 2645.

Both the AJ 630 and the AJ 830 operate at 10, 15- or 30

## Terminals



char./sec, but the 630, priced at \$155/mo, is a nonimpact unit, while the 830, priced at \$185/mo, is based on the IBM Selectric printing mechanism. It prints at 15 char./sec and comes optionally equipped with a portable carrying case.

Three of the firm's acoustic couplers — the A242, AD 342 and Adac 1200 — will also be on display as will the firm's entry in the modem field. The couplers are priced from \$21/mo to \$50/mo from the firm at 1065 Morse Ave., Sunnyvale, Calif. 94086.

## MFE Model 5000

### Has Three Functions

ANAHEIM, Calif. — MFE Corp. will introduce its Model 5000 data terminal in booth 2151.

Designed to function as a batch data terminal, program loader or data logger, the terminal employs a digital cassette recorder.

The vendor said the device features a storage of 145K char./cassette; RS-232-compatible I/Os with switch-selectable speeds of 110, 300, 1,200- or 2,400 bit/sec; half- or full-duplex operation and a micro-processor buffer for maximum data transfer rates.

The Model 5000 is available from the company at Keewaydin Drive, Salem, N.H. 03079.

## Exchange System Set

ANAHEIM, Calif. — McDonnell Douglas Electronics Co. will use booths 2501, 2503 and 2600 as the launching pad for a data exchange system which can provide voice response to a variety of terminal equipment.

The 1018 series can accommodate a wide range of CRTs and other I/O devices, the firm said, in addition to the Touch-Tone and voice-answer-back capabilities, the firm said from Box 426, St. Charles, Mo. 63301.

For your total business

General Ledger

Accounts Payable

Inventory Control

Accounts Receivable

Sales Order Entry

Under DataShare control

- The Dataprint 5500
- 300 lpm printer
- 2 large disk units

## Intelligent Unit, Display Mark Sycor

ANAHEIM, Calif. — Sycor, Inc. will exhibit its Model 340 intelligent terminal and the Sycor 250 intelligent display system — both with Sycor-designed and Sycor-manufactured dual flexible disk recorders — in booths 2547, 2549 and 2551.

### DC Power Supplies Set

ANAHEIM, Calif. — Powertec, Inc. will show a line of open-frame DC power supplies called OEM II in booths 1655, 1657 and 1651; the firm said from 9168 DeSoto Ave., Chatsworth, Calif. 91311.

The flexible disk option allows Sycor 250 users a number of increased capabilities including the ability to store noncritical data during the day and transmit it to the CPU in batches or at the end of the day and the ability to key in data during CPU or line outages.

In addition, formats and programs can be stored locally and unattended transmission of CPU-processed print data can be achieved.

In two other configurations, the Model 340 will be shown with its flexible disk option. In

one setting, it will be shown with a 165 char./sec matrix printer. In a separate large-scale remote job entry configuration, the Model 340 and its high-speed card reader and 300 line/min printer will demonstrate its IBM 3270 capabilities.

The company will also exhibit its cassette and flexible disk OEM recorders. The flexible disk recorder features a positioning time of 117 msec to the center of the diskette.

Sycor is at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

## Spintronic Coming Out

ANAHEIM, Calif. — The Spintronic portable terminal will be featured in booths 1554 and 1556 by Interdata Data System Corp.

The 30 char./sec device, which will be on exhibit for the first time, combines the Diablo Hystyle character printers, an IBM-Selectric-style keyboard and a new power supply.

In addition to the light weight power supply — which will be available for OEM purchase — the unit features an

8-bit microprocessor with 4K bytes to 6K bytes of firmware, 10-pitch or 12-pitch switch-selectable printing, vertical spacing at 6- or 8 line/in. data transmission rates of up to 300 bit/sec, 21-key numeric keypad, choice of API, Ascii or standard keyboards and a plotting package.

The unit is priced at \$3,995 in quantities of 10, the firm said from 1851 Interstate 85 South, Charlotte, N.C. 28208.

## data processing needs: Datapoint's New, Expanded Datashare System

- Datapoint 5500 Central Processor/Mass Storage Disk Units
- Datapoint 3600 Remote Terminal/Hardcopy Terminal Printers
- Datashare III

The new Datashare system, from Datapoint, builds on the success of the initial Datashare based on the Datapoint 2200 processor. The concept remains the same — a compact central computer with associated peripherals providing the people who need it most compute power at remote work stations for a variety of business data entry and processing needs — but capacity for work throughput and diversity of applications have expanded greatly with the new version. For businesses whose workload has outgrown both available equipment and available budget, Datashare represents a real breakthrough. Nowhere else can you get such a total business data processing capability at such a modest cost. Let's take a closer look at these new elements and what they can do for you.

The Datapoint 5500 — a compact but powerful business processor that incorporates the very latest integrated circuit technology. Physically the same size as the Datapoint 2200 and 1100, the 5500 offers 64K high-speed internal memory and an advanced processor architecture with a wide variety of printers, tape units, and disk systems (see list). It can supply up to 16 work stations simultaneously with compute power. In one typewriter-sized unit the 5500 provides the basis for an independent "computer utility" operation (even while it serves optionally

as a highly efficient data communications link to a central computer complex.) Fully compatible with software created for the Datapoint 1100 and 2200 systems.

The Datapoint 3600 — a low-cost video terminal with upper case/lower case capability, a unit designed for efficient satellite use with a Datashare configuration. (Datashare also works efficiently with other Datapoint units such as the 1100 and 2200 and all TTY-compatible terminals.) The optional 120 CPS belt printer serves as a hard copy outlet for work stations where printer information is desirable.

Datashare III — the enhanced master control system that extends Datashare capability to 16 remote stations, allows users at these stations access to the expanded number of peripheral units that may be associated with the 5500. Version III offers greatly improved file creation and handling capability, including advanced file protection/security and virtual memory techniques.

Additional Datashare components have been added but the Datashare philosophy remains the same — to provide the business user a low-cost, highly productive way to disperse a powerful data entry and data processing capability among departments and field offices. Either as an independent system or as part of a larger computer/communications network, the new, expanded Datashare is available now to help your organization. For further information contact the Datapoint sales office nearest you or write or call Datapoint Corporation, attention: Marketing Department, 9725 Datapoint Drive, San Antonio, Texas 78284 (512) 690-7151.

### DATAPoint CORPORATION

The leader in dispersed data processing

### Datashare Central Processors and Peripherals

#### Processors

Datapoint 2200 with 16K

memory

Datapoint 5500 with up to

64K memory

#### Data storage

Cartridge disk (2.4 mil. char.

storage on replaceable disks).

4 max. 2.4-9.6 mil. char.

storage on 2200 or 5500.

Mass storage disk 20-40 mil.

char. storage on 2200

25-200 mil. char. storage

on 5500

#### System Printers

300 LPM Drum Printer

60-120 LPM Matrix Printer

120-120 LPM Belt Printer

30-60 CPS High quality print

servo printer

#### Communications to terminals

Direct wire, 1200 Baud

Lensed line, 1200 Baud

Dial up, 300 Baud

Card Reader

300 cpm

#### Magnetic tape drives

556,800 and 1600 bpi

7 and 9 track

#### Cassette tapes

Integral to 2200 and 5500

processors

#### User terminals

Datashare 3600 terminal

Datapoint 1100 intelligent

terminal

Any TTY-compatible terminal

#### Terminal printers

120 cps Belt Printer

Any Datapoint/System printer

used with Datapoint 1100

and 2200

## Terminals at NCC

### Termiflex Brings Latest Adapters

ANAHEIM, Calif. — Two adapters for its line of hand-held terminals will be introduced by Termiflex Corp. in booth 1718. The Termicoupler, a hand-held inquiry/response terminal with full Ascii keyboard, will also be displayed.

The TA/2 adapter can be used as either an RS-232C or current-loop, direct-connected box while simultaneously going on-line to another device for applications such as writing messages off-line for batch transmission or logging of programs from the remote



Termicoupler

into a local system, the firm said.

The TA/1 adapter provides RS-232C direct-connect capability for a terminal drawing power from a Termicoupler, the firm said, and does not permit simultaneous connection.

The TA/1 is priced at \$60 and the TA/2 at \$150, the firm said from 17 Airport Road, Nahans, N.H. 03060.

### TTL-Compatible Punch Unveiling of Decitex

ANAHEIM, Calif. — A 75 char./sec tape perforator will be unveiled by Decitex in booth 2647.

Capable of punching standard-size tapes, the unit has a TTL-compatible interface and uses a 5-level code standard, with 6- and 7-level codes available as an option.

Roll or fanfold paper can be accommodated, the firm said from 250 Chandler St., Worcester, Mass. 01602.

The new Datashare — supporting up to 16 remote work stations



Each remote unit may be equipped with a printer unit for hard copy capability.

Home Office: 9725 Datapoint Drive, San Antonio, Texas 78284 (512) 690-7151 • Dallas Office: Atlanta (404) 458-2423 • Austin (512) 452-9424 • Baton Rouge (504) 960-3700 • Boston (617) 893-6442 • Chicago (312) 298-1400 • Cincinnati (513) 421-4125 • Cleveland (216) 821-5000 • Denver (303) 775-2651 • Detroit (313) 228-9070 • Fort Worth (817) 478-8070 • Grand Rapids (616) 290-8401 • Hartford (603) 877-4581 • Honolulu (808) 524-3718 • Houston (713) 588-0791 • Los Angeles (213) 564-5400 • Louisville (502) 268-1400 • Minneapolis (612) 334-4444 • Milwaukee (414) 382-2614 • New York (212) 278-2211 • New York (212) 278-4444 • Phoenix (602) 968-1340 • Philadelphia (215) 387-4477 • Pittsburgh (412) 268-2600 • Portland (503) 238-3511 • Raleigh (919) 278-2211 • San Diego (619) 444-4444 • San Francisco (415) 382-2614 • Salt Lake City (801) 228-2211 • San Jose (415) 281-2211 • Seattle (206) 228-2211 • Springfield (417) 228-2211 • St. Louis (314) 228-2211 • Tampa (813) 228-2211 • Tulsa (918) 228-2211 • Vancouver (604) 228-2211 • Victoria (250) 228-2211 • Winnipeg (204) 228-2211 • York (416) 228-2211 • Zionsville (317) 228-2211

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## Has 2,000-Character Screen

# Conrac Readies First in Line With Microprocessors

ANAHEIM, Calif. — The first in what is to be a line of terminals employing microprocessors will be introduced by Conrac

Corp. in booth 1267 here.

The Model 480/25, which displays a 2,000-character screen in an 80-character by 25-line for-

mat, is based on a microprocessor that can be reprogrammed through the use of programmable read-only memory (PROM). The unit is fully teletypewriter-compatible and is available with full edit capability.

The unit operates at up to 9,600 bit/sec standard, but higher operating speeds are available as options.

Another option is the ability to

support up to four peripheral devices, including floppy disks or printers. In addition, 64K of random-access memory is available as an option.

The firm will also show its 401 adaptive terminal for polling configurations and its 480/8 TTY Plus, which is a teletypewriter-compatible unit for under \$1,000 in quantity orders.

The new device is designed for the OEM customer, Conrac said, since all edit features and operat-



Conrac Model 480/25

ing characteristics of the unit are selectable, permitting easy customization, according to the firm at 600 N. Rimdale Ave., Covina, Calif. 91722.

## Remote Batch Units Showcased

ANAHEIM, Calif. — Cincinnati Milacron Co. will introduce three remote-batch terminals and a disk-based operating system for its line of minicomputers in booth 2447.

The terminals — The CIP/220, CIP/240 and the CIP/260 — are designed to operate with Control Data Corp., IBM and Univac

computers operates in a multi-programmed, multiple-terminal mode under RPG-II, according to Cincinnati Milacron, Mason-Morrow Road, Lebanon, Ohio 45036.

## Terminals

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mainframes respectively, with the 220 operating under EX-PORT/IMPORT disciplines, the 240 operating under Hesp or ASP line disciplines and the 260 operating with 1100 series computers using Exec 8.

The basic configuration of the terminals includes a CIP/2200B minicomputer with direct memory channel, read-only memory, 16K of core memory, 600 card/ min card reader, 65 line/min printer and a bisynchronous and modem controller.

Transmission rates of 1,200-2,000, 2,400, 4,800 and 9,600 bit/sec are possible. CRTs and a "wide range" of peripherals are available, the firm said.

The disk-based operating system for the firm's line of min-

## Practical Automation

### Showing Ticket Printer

ANAHEIM, Calif. — Practical Automation, Inc. will introduce the Model DMTP-5 programmable ticket printer at booths 1161 and 1163.

The unit will print up to 25 alphanumeric characters and symbols across the width of a standard multipart ticket.

Operation is said to be fully automatic, requiring only that the operator present a ticket to the printer, where it is sensed, captured and motor-driven to an internal stop for printing and then ejected.

Data input is ASCII, the firm said, and the printing rate is approximately 2 line/sec with up to 35 lines possible on a ticket.

The unit costs \$263, the firm said from Trap Falls Road, Shelton, Conn. 06484.

### Cogar to Introduce 1503

ANAHEIM, Calif. — Cogar Corp., a subsidiary of the Singer Co., will be showing the Singer Model 1503 disk intelligent terminal system in booths 2357 and 2359.

While the firm's 1500 series was first introduced in 1973, Cogar will introduce the 1503 to U.S. users at the show.

Cogar is at Cosby Manor Road, Utica, New York 13502.

# INTRODUCING THE FIRST MINICOMPUTER THAT CAN SUPPORT UP TO



### The BTI 4000 series.

An entirely new line of minicomputer-based timesharing systems. Based on a new central processor, mass storage controller and communications processor. A major advance over the proven 3000 series.

### With a revolutionary new idea.

A single 4000 system supports up to 32 concurrent users, with many new features for the system manager and user. But we didn't stop there. Up to eight 4000 systems can be "clustered" to allow sharing of central processor and disk storage facilities. That means as many as 256 users can access a clustered 4000 system—and to each user it looks like one system.

### Start now. Grow later.

If 256 ports are too many for you right now, that's okay. Just start with a single system, or two, or exactly the number you want. And add more capacity as you need it.

BTI's 4000 system grows as you do—so you're never paying for more system than you want, or trying to get along with less system than you need.

### Storage—lots of it.

Disk storage comes in 2.4 megabyte increments for smaller systems, and in 36 or 73 megabyte increments for the bigger applications. And if your needs are bigger yet, you can have almost 5 billion bytes of on-line storage on your 4000 system.

### No hibernation.

You don't have to put a 4000 system to sleep to load or dump data, or to back-up your software. Selected portions or the complete contents of disk packs can be "mounted" or "dismounted," on-line. Files can be loaded from or dumped to magnetic tape—on-line. And a SNAP back-up allows you to copy the entire contents of a disk pack for safekeeping, with individual user activity suspended for a few minutes.

### BASIC-X.

The 4000's user language, a superset of BASIC, greatly extended for more user power in business and scientific applications. BASIC-X,



## From Lear Siegler

### Compact ADM-3 Parading

ANAHEIM, Calif. — The ADM-3, a compact version of the ADM-1 terminal, will be shown for the first time by Lear Siegler, Inc. in booth 2348.

The unit has a 12-in. (diagonal) CRT screen and a 64-character display set in addition to a full-size keyboard. The standard display is 960 characters in 12 lines, and a 24-line version is available, permitting display of up to 1,920 characters.

In addition to the normal 53

keys, the terminal has the capability of generating up to 128 Ascii codes. Full- or half-duplex transmission may be selected with speeds of up to 19.2 kbit/sec.

RS-232 or current-loop interfacing is switch-selectable and the unit is equipped with an RS-232C interface.

The unit is priced under \$1,000 with OEM discounts available, the firm said from 714 N. Brookhurst St. here at 92803.

## Terminals

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### Vector Showing CRT Line

ANAHEIM, Calif. — Vector General will show its complete line of high-speed graphics terminals in booth 2615, the firm said from 21300 Oxnard St., Woodland Hills, Calif. 91364.

## 'Silent' Mini Bee 4 Set To Buzz at Beehive Booth

ANAHEIM, Calif. — The Mini Bee 4 will be displayed in booth 1553 by Beehive Medical Electronics, Inc.

Operating at rates up to 9,600 bit/sec, the silent replacement for buffered teleprinters features line and block transmission, addressable cursor, upper- and lower-case character generation, display operation in format or character mode and all teletype-writer-compatible codes.

The unit also has full- and half-duplex on-line operation, RS-232C compatibility, 25 lines of 80-character display, line feed, carriage return and scrolling capability for a price of \$2,395 before quantity-order discounts.

### Other Bees

The firm will also show the teletypewriter-compatible Mini Bee 2, priced at \$1,792, and the Super Bee 3, which operates as an operator-controlled portable computer terminal with the capability to be a daisy-chain port for downstream polling. It is priced at \$3,695.

Beehive is at 870 W. 2600 South, P.O. Box 19244, Salt Lake City, Utah 84120.

## Intershake Electronics To Bow at ARC

ANAHEIM, Calif. — Atlantic Research Corp. will use booth 1465 to exhibit its new data communications tester, Intershake.

The device simulates software, modems and terminals and can operate at speeds of up to 9,600 bit/sec. A built-in library of over 100 test functions include polling protocols, trapping selected characters, logging characters in any position in the data stream and transmitting control characters.

### Six Test Messages

Six test messages — Baudot, Ascii, Ebcidic, EBCDIC, Fido and Electric code — are also included in the library.

The unit is priced at \$7,490 from the firm at 5390 Cherokee Ave., Alexandria, Va. 22314.

## Graphic Display Units Focus of Imlac Exhibit

ANAHEIM, Calif. — Imlac Corp. will be exhibiting two interactive graphic display systems, which can operate either as remote terminals or free-standing graphics systems, in booths 2119, 2121, 2123 and 2125.

### Graphics Display

The PDS-1G provides an intelligent graphics display terminal with fully programmable minicomputer.

The second system is the PDS-4 interactive graphics display system complete with minicomputer and 2D-image manipulation hardware, the firm said from 296 Newton St., Waltham, Mass.

## Datadial to Perform At Datran Exhibit

ANAHEIM, Calif. — Data Transmission Co.'s (Datran) booths 2452 and 2454 will feature a display of the capabilities of the firm's Datadial data transmission service and the Datadial keyboard that can be used to attach to the system.

The specialized command carrier is at 8130 Boone Blvd., Vienna, Va. 22180.

# TIMESHARING SYSTEM 256 USERS.

tell us you have a problem. In minutes, a timeshare specialist can access and exercise your system over the telephone, just as if he were standing next to it. With the 4000's on-line diagnostic capability, all it takes is a phone call.

### Available today.

Our new 4000 series multiprocessor systems aren't ideas waiting for an order to see if they'll work. They're available for a wide array of business, commercial and scientific applications. Like dealer inventory, entertainment ticketing, financial services, real estate transactions, word processing, engineering design, manufacturing control.

The 4000 system offers a high usership capacity for a low cost of ownership, and can be a big money-maker for commercial timesharing firms, a big money-saver for in-house systems.

### Representative Prices

Ports	Mass Storage (Megabytes)	Price
16	5	\$ 55,500
32	72	89,000
64	219	171,276
128	365	305,686
256	657	561,702

The BTI 4000 series Interactive Timesharing Systems. Call or write for details.

East: Cherry Hill, NJ (609) 795-2334

Midwest: Schaumburg, IL (312) 882-2111

West: Sunnyvale, CA (408) 733-1122



**BASIC Timesharing**

650 North Mary Avenue, Sunnyvale, CA 94086

See a 4000 at the Computer Caravan

developed for BTI's 3000 series, now augmented for the 4000. BASIC-X has string arithmetic, providing extended precision for the accountant; a flexible file-handling structure with powerful features like non-interfering shared read/write access, and many other niceties that make the programmer's job easier and faster.

### Uptime.

Because central processor and disk storage facilities can be deployed dynamically, you can pull a CPU or disk drive out of service for any reason, while maintaining system availability to all your users. Something to think about if your application can't tolerate any interruptions.

### Fast, all-hours service.

24 hours a day, seven days a week, BTI service engineers are ready to help. Just call and

**Who'd dare introduce  
a data system with  
FORTRAN?**



Only a company with a data system that has so much you won't care what its high level language is called.

Data General is the company. And the data system is the Eclipse™ C/300.

Eclipse C/300 is an on-line, multiterminal, interactive data system that extends and complements your present large computer system. A system you can actually afford to use for dedicated operational support.

It has a data base-oriented file system called INFOS™ that has all the conventional access methods: SAM, RAM, ISAM. Plus an unconventional method called DBAM (Data Base Access Method).

DBAM has such advanced features as data base inversion, dynamic space management, hierarchical key specification, partial records, generic and approximate keys, and relative position processing.

INFOS works with our Mapped Real-time Disc Operating System (MRDOS) which supports dual operations such as multiterminal on-line activity at the same time as batch processing or direct communication to other computers.

Our new, easy-to-use RPG II generates planned and unplanned reports.

You also get our re-entrant multitasking FORTRAN with full INFOS data manipulation capabilities that make it ideal for on-line multiter-

minal environments.

And to communicate with your 360/370, our multileaving, interleaving HASP emulates IBM's remote job entry workstation.

The computer is the state-of-the-art Eclipse C/300. The one with 256K byte memory capacity, a comprehensive commercial instruction set, optional Error Checking and Correction (ERCC) that automatically corrects errors in main memory, and support for a mammoth 700 megabytes of on-line storage.

Yet a 96K byte Eclipse C/300 computer with ten million bytes of disc, line printer, 60K CPS tape drive, 2 CRT's and a synchronous communication adapter plus INFOS, RPG II, FORTRAN, MRDOS, Sort and Merge, HASP and utilities costs less than \$80,000.

Which is a language anyone should be able to understand.

- ☐ Send me the Eclipse C/300 brochure.
- ☐ Send me a sales engineer.
- ☐ Send me the brochure that shows how small computers can be dedicated to operational support.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_

## Data General

Data General Corporation, Southboro, Massachusetts 01772. (617) 485-9100. Data General (Canada) Ltd., Ontario, Data General Europe, 15 Rue Le Sueur, Paris 75116, France. Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

## Cal Data, Odec Sharing Space Of Data 100 Remote Batch CRTs

ANAHEIM, Calif. — The Data 100 Corp. exhibit in booth 2321 will feature the products of California Data Processors (Cal Data) and Odec, both of which have been acquired by Data 100, as well as the Data 100 line of remote batch terminals.

In the Data 100 line, the Model 76 remote batch terminal will be displayed as will the remote keystation which was recently developed for users of the firm's keyboard system. The keystation allows the user to access the keyboard system via the Direct Distance Dial network or leased lines and consists of a keystation table with integrated modem, a 256-character CRT and an IBM 029 keypunch or Selectric keyboard.

From Cal Data, the firm will be exhibiting the Cal Data I microprogrammed minicomputer, designed for emulation of general-purpose computer architectures, according to the firm. The unit uses 675-nsec core memory modules for a capacity of 80K words, even though 850-nsec core memory modules are available for systems with a capacity up to 128K words.

### Taste of Termetnet 30 Available at GE Booth

ANAHEIM, Calif. — General Electric Co. (GE) will show two members of its Termetnet printer family — the Termetnet 30 and the Termetnet 120 — in booths 1467, 1565 and 1567.

While the Termetnet 30 is intended for the user who requires a 30 char./sec teletypewriter, the 120 is said to suit those minicomputer users, intelligent terminal users and small-systems users who need a line printer.

Both printers are available for purchase from GE's Data Communication Products Department in Waynesboro, Va. 22980.



Termetnet 30

### User-Programmable OP-I

#### To Highlight Ontel Exhibit

ANAHEIM, Calif. — Operating out of booths 2744 and 2746, Ontel Corp. will exhibit its Ontel OP-I intelligent terminal system.

User programmable, the intelligent terminal display system is designed primarily for the OEM market and features three microprocessors — a central, a display and an input/output unit.

OP-I is operational in stand-alone or on-line environments, according to the vendor, and programs can be loaded from local storage or a host computer.

The system can be obtained from the firm at 3 Fairchild Court, Plainville, N.Y. 11803.

#### Ferrite Floppy Head Set

ANAHEIM, Calif. — A ferrite floppy disk head will be featured by Nortronics Co., Inc., in booth 1641.

The unit, 8803006, is IBM-compatible and is built in a round holder with the active core area made of dense ferrite and the surrounding area in ceramic.

Nortronics is at 8101 Teah Ave. North, Minneapolis, Minn. 55427.

## Terminals.

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The Odec contribution to the exhibit will consist of three of the firm's impact printers — the Models 1400, 2400 and 3400 — which range in speed from 125 line/min to 350 line/min, the firm said from 7725 Washington Ave. South, Edina, Minn. 55435.

## Incoform Software to Perform

ANAHEIM, Calif. — Incoform Corp. will use booths 1157 and 1159 here to demonstrate its line of intelligent terminal operating under Incoform, a forms-oriented, source-data-entry software package developed for use with the diskette-based SPD 20/20 multi-station intelligent terminal system.

Terminals to be shown include the SPD 10/20 CRT, which includes a terminal processing unit, a 4,096-byte magnetic core memory, hardware-controlled interrupt structure, an arithmetic logical processor, a refresh module and timing unit, a real-time clock and automatic memory-protect and power-save circuitry.

The SPD 325 video terminal system, a stand-alone remote display system which the company said is compatible with IBM 3270 data communications

protocol, will also be shown. A buffered-printer option allows a remote stand-alone configuration to have a separately addressed and buffered printer.

The SPD 20/20, developed to work in a cluster configuration with multiple display stations controlled by a terminal-processor unit, will also be on hand.

The Incoform system, Incoform's latest product, provides users with a complete set of applications-oriented, general-purpose software modules for custom-forms design and data-entry control.

The SPD D-250 diskette system and the SPD P-100 dot-matrix impact printer may also be seen, the firm said from 6 Strathmore Road, Natick, Mass. 01760.

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## For Remote Communications

## Harris Readying Display of Processors



Harris Corp. Cope 1600

ANAHEIM, Calif. — Harris Corp. will display two of its Cope 1600 remote communications processors in booth 1317.

Also shown will be the company's Cope

technical control system.

One 1600 system, with a 600 card/min card reader, two 600 line/min printers, two 9-track magnetic tape units and two synchronous communications interfaces (9,600 bit/sec dedicated and 4,800 bit/sec dial-up) will communicate concurrently with two host processors.

The other Cope 1600, configured with a 1,250 line/min printer, 1,200 card/min card reader and 9-track magnetic tape unit, will communicate to a host processor at 9,600- and 4,800 bit/sec concurrently. While communicating with dual hosts, both systems will perform concurrent background media-conversion tasks.

The dual 1600 systems will operate through Harris' Cope Technical Control System.

The system displayed will include such

new features as a patch-field panel and multi-drop line controller.

The company's data communications division is at 11262 Indian Trail, P.O. Box 44076, Dallas, Texas.

## Motorola Transceiver Among Array of Units

ANAHEIM, Calif. — The NMOS M6800 microcomputer and emitter-coupled logic (ECL), bipolar LSI and linear devices will be shown by Motorola in booth 1462.

A point-of-sale display, utilizing the MC6800 microcomputer, will be operational and the MC6860 modem will be demonstrated in a 300 bit/sec serial data system.

## Terminals

at

NCC



Two new devices, the MC10194 dual simultaneous bus transceiver and the MC10183 4-bit by 2-bit multiplier will also be shown. The MC10194 provides two full-duplex, digital data paths; the MC10183 can multiply 2's complement output, without correction, the firm said.

## MOS Memories

Memory arrays containing MOS devices such as the MCM7001 static 4K RAM and the MCM6605 dynamic 4K RAM will also be displayed. Bipolar LSI components for memory system and serial digital data processing are also included; these devices are the MC8505 dynamic address refresh logic circuit (for MOS memories) and the MC8504/MC8506 polynomial generators. The MC8504/MC8506 can be used to detect serial data transmission errors, according to the Phoenix-based firm.

## D-302 Miniature CRT To Be Informer Star

ANAHEIM, Calif. — The D-302 miniature CRT terminal will highlight the display in booth 1722 operated by Informer, Inc.

## Dual Addressing

The unit has dual-addressing capability as well as polling capability. The monitor displays 16 lines of 32 characters each, the firm said, and the unit can operate at a maximum of 9,600 bit/sec.

The device has a daisy-chain capability and is compatible with RS-232 standards, the firm added from 2218 Cotner Ave., Los Angeles, 90064.



Informer D-302

## Cal-Trox Security System Contains 260 Million Codes

ANAHEIM, Calif. — A security system for communications terminals will be displayed in booth 2108 by Cal-Trox Privacy Systems.

## Two Modes

The Model 77 DPD system can be used with high- or low-speed modems in either synchronous or asynchronous modes. The unit contains over 260 million different codes which can be set by thumbwheel switches.

A Model 72A is also available which offers over 67 billion different codes, the firm said from 1102 College Ave., Santa Rosa, Calif. 95404.

## Wire-Wrapping Machine Set By Contact Systems

ANAHEIM, Calif. — Contact Systems, Inc. will display a wire-wrapping machine priced at \$8,800 in booth 1125, the firm said from 1000 Brook Road, Danbury, Conn. 06810.

## gent '3270' BATCH terminal.

you can install more terminals per line, and maybe even install fewer lines.

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## France's Logabax Importing CRTs For Exhibit by New U.S. Division

ANAHEIM, Calif. — The Logabax terminals from France will be displayed by a new U.S. division of the firm in booth 2659.

The LX 180/57 is transparent on IBM 2740 Model II communications networks, the firm said, provides printing speed of 180 char./sec and prints lines of up to 220 characters with a 132-character line standard on 8-1/2-in.-wide paper.

The unit features 10 prerecorded message keys, italics and two-color ribbons for a price of \$199/mo on a one-year lease.

### Delta Data to Fete Low-Cost Model 4000

ANAHEIM, Calif. — Delta Data Systems Corp. will exhibit its low-cost Delta 4000 microprogrammable display terminal featuring the paging variable buffer memory, eight function keys, 96-character upper/lower-case set, plus display of control and escape-sequence commands, full text editing and four-level priority control in

## Terminals

At  
NCC



booths 1458 and 1460.

In addition, the firm will exhibit an order-entry software package, which utilizes Delta Data's Multiterm 2 controller and Delta 4000 and 5000 displays and is equipped with the Delta light pen. The dual deck cassette and a hard-copy printer will also be on display.

The company will also feature its 500 family of display terminals, including a Delta 5500 and the Delta 5000/APL terminal, featuring dual character sets (ASCII upper/lower case and ASCII upper/APL case), APL keyboard and unique APL overstrike.

Delta Data is in Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

lease.  
The firm will also exhibit the LX 180/KSR, which has transmission speed switch-selectable up to 2,400 bit/sec, full ASCII character set and an optional 10-key pad. It is priced at \$170/mo on a one-year lease.

The U.S. division of the firm is at 10889 Wilshire Blvd., Los Angeles, 90024.



Logabax LX 180/57

## First On-Line Showing Of '40+' Display Set

ANAHEIM, Calif. — The first on-line demonstration of International Communication Corp.'s 40+ display is slated for booth 1505 by the firm.

The unit employs a microprocessor and features formatted data entry and editing, forms calculation and a self-diagnostic feature for the base price of \$128/mo or \$3,850 purchase.

The firm is at 8600 N.W. 41st St., Miami, Fla. 33166.

### ICC 40+ Display

## Lorain Systems Ready

ANAHEIM, Calif. — Uninterruptible power systems that range in capacities from 500 watts to 2 megawatts will be featured by Lorain Products Corp. in booths 1754 and 1756.

The firm, at 1122 F St., Lorain, Ohio 44052, said a 90 kilowatt system would cost approximately \$68,000.

## Voice Synthesizer to Speak At Federal Screw Works

ANAHEIM, Calif. — The Vocal Interface Division of Federal Screw Works will show its voice synthesizer in booth 2557. The Votrax Model VS-6 electronic voice system provides synthesized speech with an unlimited vocabulary. This small solid-state device accepts standard ASCII characters as commands to produce phonetically programmed human speech.

### Continuous Speech

Votrax can produce continuous speech with an input data rate of as low as 150 bit/sec, the firm said.

In addition, the vendor's Vocal Interface Division will be introducing a line of low-cost, limited vocabulary digitized speech systems, the firm said from 500 Stephenson Highway, Troy, Mich. 48064.



## At Bell & Howell

# COM Gear to Be Put Through Its Paces

ANAHEIM, Calif. — Booth 2328 will be the scene of a demonstration of computer-output microfilm (COM) equipment offered by the Bell and Howell COM Products Division. The 3700 Model 3 is a high-speed, multiframed camera with a maximum printing speed of

26,000 line/min and up to 160 char./line.

### Comflo 413

The Comflo 413, available for either diazo or vesicular microfilm, exposes, cuts and processes copies automatically at speeds up to 1,800 fiche/hour (vesicular) or 1,300 fiche/hour (diazo).

The firm will also discuss the capabilities of its Comflo soft-

ware packages, which are available to produce 105mm microfiche and 16mm roll formats. The software is said to allow users to specify parameters for the desired COM format from either a data file or print image file.

In addition, it is said to allow users with Cobol compilers extensive titling and indexing ability.

The firm is at 1451 Quail St., Newport Beach, Calif. 92660.

## Monroe to Send Product Variety

ANAHEIM, Calif. — A range of calculators, a scientific microcomputer and a teleprinter interface will be shown in booths 2718 and 2720 by Monroe.

The Beta 326 microcomputer allows more than 100 programmed operations to be accessed from the keyboard, the firm said.

### Communications

The teleprinter interface was designed to allow the firm's programmable calculators to have the capability to communicate to line printers, teletypewriters, instruments or phone lines through modems or acoustic couplers, the firm said from 550 Central Ave., Orange, N.J. 07501.

## Gould Bringing Printer/Plotters



Gould 5100

ANAHEIM, Calif. — The exhibits of Gould, Inc. in booths 1746, 1748 and 1750 will fea-

ture two of the firm's electrostatic printer/plotters.

The Gould 5200, designed primarily for engineering and scientific applications, features a resolution of 200 dot/in. vertically and horizontally to increase image density and produce smooth curves. In printing applications, it operates at 650 line/min while generating 132 char./line on 11-in.-wide paper.

### Two Fonts

It has an eight-bit data path for input and comes with the 96-character Ascii set with both Helvetica Medium and Times Roman fonts available as standards.

The Gould 5100 plots graphic material, such as A to D size engineering drawings, on 22-in.-wide paper at up to three in./sec with a resolution of 100 dot/in. vertically and horizontally. Interfaces are available to connect both units with most mini-computers, the company said from 20 Oxtop Rd., Newton, Mass. 02164.

## Computer Link Focus On Forms Processing

ANAHEIM, Calif. — Forms processing will highlight Computer-Link Corp.'s display in booths 2619 and 2621.

The Rowe 182 system handles forms from the computer printer and prepares them for the post office by decoding, bursting, slitting, bypassing, folding, adding inserts, enveloping and metering postage.

In addition, the firm will display the Series 400 reinking machine, which is capable of handling OCR as well as regular ribbons, according to the firm at 14 Cambridge St., Burlington, Mass. 01803.

## Infoton to Show CRTs

ANAHEIM, Calif. — Booth 1137 will be the setting for a display of the Vistar/2 and Vistar/GT display terminals produced by Infoton, Inc.

The Vistar/2 is a stand-alone terminal with a 24-line by 8-character capacity. It features the 64-character Ascii set and can operate at up to 9,600 bit/sec, at a price of \$2,795, the firm said from Second Ave., Burlington, Mass. 01803.

## ACT Printer Terminal Series Due



Series 900 printer terminal

ANAHEIM, Calif. — The Series 900 interactive dot matrix printer terminal, capable of speeds of 120 char./sec bidirectionally,

RCA Teletypewriter Coming ANAHEIM, Calif. — In booth 1703, RCA Service Co. will display its Model 33-ASR friction-feed teletypewriter that is equipped for alternate TWX or Dataphone use.

The Extel receive-only printer with 8-level Ascii for 10- or 15 char./sec operation at a price starting at \$54/mo will also be on display, according to the firm from Camden, N.J. 08101.

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to



Anaheim

## Van San Exhibit Stars Quiztizer

ANAHEIM, Calif. — Van San Corp. will display its Quiztizer unit, a lightweight cabinet designed to control noise produced by the Centronics printer in booth 1254.

For use with the printer on a stand, desk or table, the unit can be installed without fasteners, tools or machine modifications, the company said.

### Plexiglass Shield

A plexiglass shield allows inspection during machine operation and may be raised for loading and adjusting paper and for access to all controls.

Van San is at 1180 Centre Drive, City of Industry, Calif. 91748.

## Plotters to Bow At Glaser Booth

ANAHEIM, Calif. — A line of computer graphic output plotters will be displayed for the first time in booth 1258 by Glaser Data Co.

The DP-1500 can be used with minicomputers or larger systems and produces graphics on a 17-1/2-in. by 22-1/2-in. flat bed. It contains a built-in microprocessor which is said to simplify the software needed to operate the system, as well as generating up to 55 standard alphanumeric symbols.

The DP-1600 is for larger drawings with a 22-in. by 34-in. bed. The plotting speed of this unit is 800 increment/sec or 3 in./sec in X-Y axis or 4.5 in./sec in diagonal axis, the Swiss firm said from its U.S. office at 225 Forest Ave., Palo Alto, Calif. 94301.



Glaser DP-1600 Plotter

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## Versatec Plotters Coming And On...



Versatec plotter/plotter

ANAHEIM, Calif. — Three electrostatic plotter/printers will highlight the display of Versatec, Inc., in booths 2558 and 2560. The D2030A prints at a speed of 1,200 line/min or 3 in./sec on 20-in.-wide paper. The unit, using a dual array writing head, is priced at \$14,900.

### Universal Data Line Of Modems Expected

ANAHEIM, Calif. — Universal Data Systems plans to introduce the UDS-201A, the UDS-201B



Universal Data Modem

and the UDS-201C CMOS stand-alone modems in booth 2267, the company said from 2611 Leeman Ferry Road, Huntsville, Ala. 35805.

### Mitsui Printer Set

ANAHEIM, Calif. — Mitsui & Co. will invade booths 2646 and 2648 with the Shinko M-60 60 char./sec impact printer.

The unit, with a 128-character set, features two-color ribbon, pica or elite printing, the firm said from 172 Newton Road, Woodbridge, Conn. 06525.

A C-Tek controller and 1100A printer/plotter for reproducing images from a Tektronix display will also be exhibited. The unit costs \$950 for the controller and \$6,900 for the printer/plotter. The third item on display will be the Quick-Writer, which was designed for word-processing applications. Operating at 50 char./sec, it is said to be 30 times faster than an editing typewriter in the power mode.



The unit costs \$700, according to the firm at 11,000 Burbank Road, Cupertino, Calif. 95014.

## Special Events Agenda

ANAHEIM, Calif. — In addition to sessions focusing on the 18 program areas, the 1975 NCC will offer a wide range of events for attendees under the headings of "Supplemental Sessions" and "Special Events."

Jay W. Forrester of MIT, who will deliver the keynote address Monday morning, will discuss computer modeling of social systems with reference to the economic forces underlying current inflationary trends.

On following days there will be either a special address, as on Wednesday with Jimmy Carter, former governor of Georgia, or luncheon speakers.

Monday will feature the conference luncheon with Neil Gorchow, vice-president of product strategy and requirements at Univac. John E. Sheehan of the Federal Reserve System will address the industry luncheon on Thursday.

Monday evening there will be a conference and international reception.

Those with a bent toward evening sessions can select from two on Tuesday. One will feature trade press editors and the other will look at demands on DP industry in 1980-1985 as seen through a Share, Inc. report.

Attendees who want to cavort through Disneyland will enjoy Disneyland day on Wednesday, when the park will be open to attendees from 10 a.m. to 10 p.m. for \$4.75 per person. Disneyland normally closes at 6 p.m.

Also, on Wednesday afternoon, there will be a Pioneer Day program honoring the team associated with Dr. John von Neumann at the Institute for Advanced Study at Princeton. Speakers will include Dr. Willis Ware of Rand Corporation, Herman Goldstein and James H. Pomeroy of IBM and Jules G. Charney of MIT.

Special activities chairman Ross Penne is coordinating a high school computer science fair, a science film theater and a special art show entitled "The Silicon Age."

Supplemental schedules will offer a look at program funding, computing as applied to societal problems and the impact of DP on society through library systems.

Other sessions will include technological advances through aerospace requirements, analysis of design measures and applications in areas such as manufacturing, publishing and simulation as well as a look at data base management in the humanities.

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NCC — Booths 1201 — 1203

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## DM Ready to Introduce Cartridge Inspector Unit

ANAHEIM, Calif. — Data Maintenance, Inc. will introduce the DM1 Model 500 cartridge inspector in booth 1453, along with major plans to expand its turnkey disk cleaning and inspection services.

The expansion calls for establishing 50 service centers equipped to inspect and clean both disk packs and disk cartridges.

The 4923 cartridge unit is an off-line device that uses the IBM DC300A cartridge and interfaces with the 4010 family of terminals or to an RS-232C interface. It will operate at data rates up to 9,600 bit/sec with a formatted tape density of 200K bytes.

The 4631 hard-copy unit is capable of copying the entire 4010 series of terminals on a plug-compatible basis. Priced at \$400 to \$500 less than previous hard-copy units from the firm, the unit can also copy the 613 storage display.

### Harris to Headline Its Test Equipment

ANAHEIM, Calif. — Test equipment and the introduction of a new service bureau will highlight the exhibit in booth 1317 put on by Harris Corp.'s P&E Electronics Division.

An automatic system to test circuitry assemblies and verify circuit design will be on display along with the midsize IIA digital/analog tester, which is computer-controlled to provide automatic fault isolation. It has an on-line compiler and editor to facilitate the generation of test program sets, the firm said.

The computer service bureau was designed primarily for the mortgage banking industry, the firm added from 6801 Jericho Turnpike, Syoset, N.Y. 11791.

### Jacquard Highlighting Card Embosser Model

ANAHEIM, Calif. — The Jacquard Model E 100 desktop card embosser — which will be shown in booths 2353 and 2355 — is capable of embossing at rates of 120- to 240 char./min or from 2 to 4 standard credit cards per minute with full 72 characters to American Banking Association standards.

When used as a self-contained unit, blank cards have to be hand-fed to the unit and the data entered by keyboard.

The unit, which costs \$5,000, can be interfaced with the Jacquard J 100 Videocomputer and peripheral, however, to give a complete computer-controlled embossing system with automatic feeding and stacking, according to Jacquard Systems at 1505 Eleventh St., Santa Monica, Calif. 90404.

triggers in major marketing areas around the country.

The Model 500 inspector enables the operator to scan both disk surfaces with a magnified optical system that also illuminates the disk surfaces. The unit is priced under \$1,000 in small quantities, according to the firm at P.O. Box 2727, Rolling Hills Estates, Calif. 90274.

## Tektronix Sets Three Announcements

ANAHEIM, Calif. — Tektronix, Inc. will announce three products — ranging from a digital tape cartridge memory to a graphics terminal — in booth 1417, along with an exhibit of some of its older display terminals.

The 4923 cartridge unit is an off-line device that uses the IBM DC300A cartridge and interfaces with the 4010 family of terminals or to an RS-232C interface. It will operate at data rates up to 9,600 bit/sec with a formatted tape density of 200K bytes.

The 4631 hard-copy unit is capable of copying the entire 4010 series of terminals on a plug-compatible basis. Priced at \$400 to \$500 less than previous hard-copy units from the firm, the unit can also copy the 613 storage display.

The third product will be the RE4012 terminal, built to withstand extremes in temperature, humidity, vibration and shock. It will be interfaced with the 4921 floppy disk memory, the 4953 graphics tablet and the 4631 hard-copy unit.

Among the firm's standard line equipment, these will be the 4014 graphics terminal, the E4010-I graphics terminal (an economy version of the 4010 priced as low as \$3,795) and the H4010 alphanumeric refreshed terminal.

## Encoder Series

### Mag-Tek Focus

ANAHEIM, Calif. — The line of magnetic strip encoder/verifiers of Mag-Tek, Inc. will be on display in booth 1220.

Designed for banks, savings and loans institutions, airlines or other credit/identification issuers, the units can be operated manually or as part of an automated system, which can read as many as 500 card/hour, the firm said.

The units utilize individual magnetic and write heads, the firm said. There are four models: I with ABA numerical-only code; II with ABA and IATA codes; III with ABA, IATA and Minit codes; and IV with ABA and Minit, numerics only.

The firm is at 1513 E. Del Amo Blvd., Carson, Calif. 90746.

### Motorola Spots MPA-I

ANAHEIM, Calif. — Motorola Display Products plans to show the MPA-I logic analyzer in booth 1347A.

The unit, designed to analyze both hardware and software operations of microprocessors, displays 32 words of 24 bits each in hexadecimal characters on a 9-in. CRT screen.

In addition, the firm said it plans to announce a line of CRT displays in 5-in., 9-in., 12-in. and 14-in. sizes that incorporate interchangeable components and plug-in options.

Motorola Display Products is at 455 East North Ave., Carol Stream, Ill. 60187.

### Magnasonic Heads Due

ANAHEIM, Calif. — Magnetic head tags from the company compatible with IBM 7- and 9-track tape systems to those for floppy disk and cartridge tape systems will be displayed by Magnasonic Devices, Inc. in booth 2601, the firm said from 290 Duffy Ave., Hicksville, N.Y. 11801.



# COMPUTER INDUSTRY

## Two Surveys Present Varied Views of User Spending

### Growth to Slow To 8% in 1975

By a CW Staff Writer  
PALO ALTO, Calif. — Average DP spending growth will drop to 8% this year as a result of budget changes made in the early weeks of 1975, according to a study released recently by Input here.

Although 85% of the survey's respondents are looking for a business upturn in the second or third quarter of 1975, more than a third expect to reduce their DP expenditures, keeping growth below 4%, the report said.

Another 30% expect growth between 5% and 9%, including allowance for inflation.

The study estimated equipment expenditures will increase by 6.9% in 1975, with growth the fastest in communications-related equipment, particularly terminals.

Input said its findings were based on a telephone survey of corporate, financial and DP managers of 119 Fortune 500 companies as well as major government agencies, which together spent \$15.6 billion, or 60% of the DP industry's total revenues, in 1974.

No medium- or small-scale installations

### Spangle Confirms Talks

#### On Honeywell Bull Merger

MINNEAPOLIS — Negotiations regarding the merger of Honeywell Bull with Compagie Internationale pour l'Informatique (CI) are in progress, Honeywell Information Systems President Clarence W. Spangle told stockholders here last week.

Talk of such a merger has been circulating for over a month [CW, April 2].

Meanwhile, sources reported the French government is willing to allow the merger, but is withholding judgment pending polling of CI's Unidata partners, N.V. Philips and Siemens A.G.

Reduce Holdings

Spangle cautioned negotiations could break off without agreement. Terms being discussed would reduce Honeywell's holdings in Honeywell Bull to less than a majority, for which it would receive cash in return.

Compagie des Machines Bull, which owns 34% of Honeywell Bull, now holds the majority interest in the new firm, which would be called Compagie Internationale Pour l'Informatique-Honeywell Bull.

were surveyed.

These areas — insurance, banking and the federal government — share the top rank for growth in DP expenditures in 1975 which is expected to hit 11%.

Next is process manufacturing with a 9% anticipated growth rate.

These sectors experienced less pressure from the recession, which allowed them to stay closer to past DP expenditure growth rates of 15% to 16% annually, the report said.

Transportation and utilities, among the hardest hit by the current recession, rank lowest in terms of growth rate, with the retail industry just slightly ahead.

Transportation and utilities are expected to spend only 4% more on DP in 1975 than 1974, and the retail industry, despite wide-range spending on new point-of-sale equipment, is expected to show only a 5% increase in DP spending.

These two sectors are expected to bounce back in 1976 with an estimated 14% and 9% growth rate, respectively. Users surveyed will spend \$6.7 billion, or about 39% of their DP budgets, on equipment this year, for an increase of only 6.9% over last year's equipment purchases.

This represents less than half the 15% considered as the typical year-to-year industry-wide increase. Input attributed the drop to the "stretch-out" of large development projects, which releases considerable computer capacity for production processing and cuts the need for new CPUs.

General cutbacks and delays in most equipment subcategories are responsible for this reduction. Only terminals and data communications equipment expenditures will continue at a high rate, the report said.

Computer services are expected to produce about \$1.9 billion in revenues for an overall growth rate of 10.1%. Growth rate in services has been nearly double this figure during the past 10 years.

The drop was attributed to a general shift from large, user-interactive timesharing services to in-house or remote batch processing.

Personnel expenditures will be the hardest hit, with the slice of the budget pie allocated to personnel actually shrinking from 39.3% in 1974 to 38.4% in 1975, Input said.

The overall growth rate — only 5.9% — translates into \$6.5 billion in spending.

Input projected an actual decrease in the number of DP employees in transportation and retail sectors.

User cutbacks in personnel were severe in several companies surveyed, according to the report, with some indicating that the previous three or four years of prosperity had added considerable fat to development and systems staffs.

### Budgets to Rise 14% During Year

By Nancy French

Or the CW Staff

WALTHAM, Mass. — The recession that upended growth in almost every other industry will scarcely dent computer suppliers' profits this year, judging from 1975 DP user budgets surveyed by International Data Corp. (IDC).

Describing spending as "brisk for all of 1975," the IDC report estimated DP spending will reach \$25.3 billion this year, with suppliers feeling only a "minimum" recessionary impact.

As of February, budgets for equipment, services and salaries still were up 14% over those reported in 1974, the report said, with communications gear expected to be the single largest area of product growth.

Excluding terminals and autotransaction equipment, the report estimated users will spend about \$2 billion for communications gear in 1975.

A smaller percentage of total expenditures will be spent on CPUs in the near future, IDC said. As the IBM System 370 life cycle winds down, equipment spending will "drift outward from the CPU."

Disks, terminals and communications controllers, which alone will account for 33% of the equipment shipped to IBM users this year, will account for more than 40% by 1976.

### Upgrading Downgraded

Real dollar growth in user purchases is beginning to decline in anticipation of the next generation of equipment, the report noted, with fewer than 15% of users surveyed planning to upgrade in 1975.

Independent peripheral manufacturers — especially those offering disks and terminals — should reap the backhand rewards of recession, according to the report.

Plug-compatible equipment is being used at 65% of large-scale IBM sites and at 33% of medium-scale (single CPU) sites.

The report was based on a survey of 63 large-scale Fortune 500 users and 65 medium-scale users. The Fortune 500 users, which IDC called "leading-edge data processors," represent 35% of the installed base.

The others, referred to as "breadbasket" companies, represent 55% of the installed base.

The \$25.3 billion spending predicted by IDC — nearly double that spent just five years ago — excluded first-time installations, the report pointed out.

Inflation accounted for only one-fifth of the increases in hardware spending reported, IDC said.

### Demand Drops

The report indicated several important factors were propping up user demand:

- Budgets for DP, a resource considered to be essential for a modern company's survival, spring from long-term commitments not easily broken.

- Migration to data base management (DBM) and teleprocessing (TP) has spurred applications development, and users are only now harvesting their computer investments. Virtually all large-scale users and 46% of the medium-scale users will be into DBM/TP by the end of this year.
- Computer operations are developing into on-line company-wide systems. Thus integrated into the functional structure of a company, DP is less easily winnowed from necessary expenditures.
- Machines at medium-scale sites work an average of two shifts a day, and, at large-scale sites, around the clock, with little capacity left to handle increased workloads.

When users' 1975 budget pie is sliced, systems and salaries will eat up the lion's share, with 36% allocated for systems and 35% going for salaries.

The slice for services is the third largest, with 12% of DP budgets going for services of all types.

Supplies, communications line costs and support hardware each will get an equal 5% slice and, finally, software, with the smallest piece, has been allotted 2% of total DP budgets.

Rather than cutting hardware spending, users will choose to "put the lid on personnel spending," the report noted.

IDC found "surprisingly little of the other traditional method of beating DP costs — namely, postponing equipment acquisitions and delaying new applications," the report said.

Only 5% of the large-scale sites had to renege on a mainframe commitment, IDC said.

In the hardware category, inflation had little effect, the report said, thanks to fixed contract prices, long-term leases and third-party deals. Large-scale sites, for example, will feel a net price increase of only 2.1%.

Medium-sized sites — where upward mobility dictates more rental and less purchase — will have a 3.3% rise.

### BASF Delivers Winchester Modules

BEDFORD, Mass. — BASF Systems has made what it claimed were the first deliveries of independent Winchester-type modules for use on IBM 3340 drives.

Deliveries have been made of the 35M- and 70M-byte modules. The 75M-byte unit is scheduled for shipment later this year.



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## Vocational Specialization Working at NCR

DAYTON, Ohio — NCR Corp.'s strategy of vocational specialization is working, Chairman William S. Anderson told stockholders in the firm's annual report.

### Semiconductor Market Projections Lowered by Wema Survey Results

PALO ALTO, Calif. — A survey released by the Western Electronic Manufacturers Association (Wema) revised downward the group's projections about the semiconductor market for 1975.

Although the report expressed a belief that the decline in semiconductor sales has "bottomed out," it predicted the 1975 worldwide market, excluding eastern block nations, will show a 17% decline over 1974.

This compares with the group's October forecast which called for a flattening of usage.

The report sees total worldwide semiconductor consumption of \$3.87 billion for 1975, compared with \$4.67 billion for 1974.

The results of the October outlook were changed to reflect "the grim reality of the fourth quarter of 1974 and the first

"We are focusing our assets and efforts on those markets where we can do a better job than any of our competitors, large or small, new or old," he said.

As an indication of the plan's

quarter of this year," said Marshall Cox, president of Interlink, Inc.

Broken down by product types, the new estimate includes \$2.09 billion in discrete devices, a 17% drop from the estimated \$2.52 billion in 1974 and \$1.77 billion in integrated circuits, down 18% from the \$2.15 billion estimated for 1974.

Cox noted that the recovery already has started in the overseas markets. Because of this and encouraging signs that orders are beginning to increase again domestically, expectations are the recovery will reach full swing by the fourth quarter and normal growth rates will return by 1976.

The Wema forecasts 1976 worldwide semiconductor consumption of \$4.84 billion, a 25% increase over 1975.

success, NCR has been able to improve its position in the retailing industry last year "despite a very aggressive effort on the part of several newcomers to that industry," he noted.

The markets targeted by NCR are retailing, banking, certain segments of the industrial and commercial markets, hospitals, schools and government.

NCR should attain further growth in revenues and earnings in 1975, he said, pointing out several stabilizing factors in the firm's mix of business.

For instance, about 22% of equipment revenues comes from equipment rentals and another 41% of total revenues is contributed by ongoing services, supplies and paper business, "but this also tends to compound stress for sharp swings in the economy," he noted.

But while not being all things to all people, NCR is planning to move into the larger systems field, recognizing the trend toward on-line systems in some of its key markets.

It has established a Communications Systems Division to consolidate all data communications hardware and software development and manufacturing.

The Special Systems Division is in charge of overall design of large communications networks.

NCR's development program for mainframes compatible with future Control Data Corp. computers is "well under way" and the program for an integrator product line of mainframes, based on the guidelines established by the two companies' Advanced Systems Laboratory, is on schedule, Anderson said.

"The program will provide us with very powerful central processors capable of serving large DP networks. It will also enable us to upgrade our larger customers to any size system."

The joint company, Computer Peripherals, Inc., is "now producing peripherals designed from the start as common products, rather than modifying products from the two companies' separate product lines as it did originally," he said.

Anderson foresees NCR in-

creasing its share of the computer market and cited the demand for firms to provide complete systems, which involve a variety of data terminals located where data originates.

Estimates call for almost one-third of revenues of the computer industry to be derived from various types of data terminals by 1980, Anderson observed.

Although the firm is carefully watching capital expenditures, during 1975, investment in property, plants and equipment will rise somewhat, he said.

R&D expenditures will also rise to \$90 million from \$74 million in 1974. The 1974 figure represented 3.7% of revenues. The firm hopes to go to a 5% level, profitability continues to improve, he said.

"Not only are we spending more R&D dollars, we are getting more out of those dollars through a better organized effort."

International Operations

NCR has revamped its international operations into four major

trading areas to maximize returns from these operations. Last year, foreign operations contributed over half of the firm's \$1.98 billion revenues.

The firm expects international business to continue to grow, although problems that complicated overseas operations in 1974 are likely to continue.

The international division's orders in 1974, up 9% over 1973, have created a sizable backlog, the annual report stated.

Instances of NCR's ability to use R&D capabilities of its overseas units include the 299, a product of NCR Germany; the 775 electronic proof system, designed and made in Canada; and the firm's first electronic cash register, contributed by Japan.

As an extension of the vocational approach, NCR intends to expand its packaged computer registers developed for special applications.

Revenues for 1974

Revenues for 1974 are broken down somewhat, revealing that the field engineering operation produced \$382 million in 1974 and DP centers \$58 million, an 11% increase over 1973 figures.

One of the fastest growing parts of the data center business is its computer output microfilm (COM) service, the report said.

Business forms and supplies contributed \$191 million to revenues, up 13% from 1973. Fastest-growing paper used in thermal printers is another of the fastest growing areas.

Equipment sales weighed in at \$877.4 million, an 8.1% increase over the 1973 figure, while equipment rentals advanced the least, 0.6% to \$246.5 million.

Paper production showed an 8% increase to \$188.5 million.

NCR's current product groupings are computer systems, terminal and data entry systems and free-standing business equipment. All but the latter showed substantial gains in revenue during 1974 compared with 1973. Computer systems' revenues grew to \$385.7 million from \$327.8 million in 1973 while terminal and data entry systems' revenues jumped to \$295.8 million from \$152.6 million in 1973.

But, looking at the former product groupings, the gains are not as dramatic. Revenues from retail systems declined in 1974 to \$350.7 million from \$363.8 million; those from DP equipment showed a slight rise to \$312.8 million from \$295.3 million; accounting machines rose to \$377.7 million compared with \$326.9 million in 1973. "Other products" also grew slightly.

A glance at the changes in consolidated financial position shows NCR's cash and short-term investments diminished to \$56.5 million in 1974, down \$64.4 million from the 1973 figure of \$120.9 million.

However, inventories soared, growing by \$220.6 million to \$239.4 million compared with \$518.8 million in 1973.

During 1974, NCR adopted the "last in, first out" (LIFO) method of accounting for its paper, business forms and supply inventories, which reduced earnings for the year by about \$4 million.

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## Despite Rock-Bottom Bidding

### Disk Cartridge Prices at Plateau: Gabai

By Molly Upton  
Of the CW Staff

CHATSWORTH, Calif.—Although some cartridge disk makers are bidding on contracts at rock-bottom prices—probably in efforts to build up their production bases—there is not a general price war going on in this area, according to Ralph Gabai, vice-president of marketing for Perlec Corp.'s Peripheral Equipment Division.

Generally speaking, cartridge disk prices have plateaued and are pretty reasonable, he said.

But in certain instances where vendors are seeking contracts from credit-worthy firms, "pricing has gotten pretty aggressive," he said.

In some instances, he explained, Perlec has walked away because it has established its base and knows what its production costs are. "It's a business decision," he explained.

Gabai explained that "no one really competes with the Diablo 31, a 2.5M byte drive. It's a very specific device, it's been around for four or five years and it's got

a huge production volume," he explained.

"Our product line, while it has a version in that capacity, has really succeeded as the mini and systems house users have strived to go to larger capacities."

The Perlec family of cartridge disks was designed to provide upward compatibility to the larger sizes such as 6M bytes and 12M bytes, he said. "So that's a different class of product, as they cost more, although the cost per bit is lower," he said.

Gabai noted that the "fine art of 'specmanship'" enters into

the disk marketing picture when one talks about the size of disks.

"How long is a byte? It could be anywhere from eight to 10 bits, depending on how you want to play the game."

Perlec currently offers two versions of cartridge drives, one model with a single removable cartridge and one model with one fixed platter and one removable. It also makes floppy disk drives.

"There are some things in the wind" he said, probably in the fixed-disk area.

### Peripherals, Dedicated Processors Seen as Major Micro Applications

LOS ANGELES—The major applications area for microprocessors over the next several years will be intelligent peripherals and dedicated processors, according to Dr. John Salzer, vice-president of Darling & Alsobrook, a management consulting firm here.

Gabai noted that the "fine art of 'specmanship'" enters into the disk marketing picture when one talks about the size of disks.

The high-speed bipolar microprocessors now being introduced will achieve significant market penetration in 1977, according to Salzer's analysis of the technology.

"But there will be a substantial price premium exacted for the high speed."

As a result, in 1977 the majority of microprocessors in use are likely to be versions with speeds not much greater than those in use today due to the cost/speed constraint.

"Toward the end of the 1970s, though, the price differential between high-speed and low-speed microprocessors will have narrowed, thus opening up a wide range new high-speed uses for the device," he concluded.

### CIT Financial Signs On to Become Eastern Airlines' Biggest DP Client

NEW YORK—CIT Financial Corp. has signed a multimillion dollar, multiyear contract with Eastern Airlines that will put CIT Financial Services' 800 offices on a computer network operated from Eastern's Doral Computer Center in Miami.

Termed one of the "most complex commercial computer systems ever developed," the data processing and business communications network, to be known as Citation, is driven by two IBM 370/195 computers.

It uses Honeywell 716 systems in 13 regional concentration centers and GTE 5540 Model 2

terminals. The signing of CIT Financial Corp. brings to about 20 the number of DP customers Eastern serves. CIT is expected to utilize about 16% of the center's processing capacity, making the company Eastern's largest client.

The Citation system is the result of a joint development effort dating back to 1971. Because Eastern incorporated fare calculation capability in its computer system as well as the basic seat inventory system used to handle reservations, its system is "particularly well suited to serve CIT's consumer financial operations," a CIT spokesman said.

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### MDS Settles Suit, Denies Guilt

UTICA, N.Y.—Mohawk Data Sciences Corp. (MDS) has agreed to settle a class action suit begun in 1971 that charged the firm with issuing false and misleading reports concerning its financial condition and earnings in 1970 and 1971.

Other defendants named in the suit filed by Michael G. Gilman were its former independent public accountants, S.D. Leidesdorf & Co., and certain former directors and officers.

The proposed settlement, which must be approved by the U.S. District Court of Southern New York, should not be interpreted "as an admission of any wrongdoing on the part of the company or its accountants," Ralph O'Brien, MDS president, said.

He explained the settlement is "in the best interest of the company since it [will] avoid the burden of expensive and protracted litigation."

Terms of the settlement call for issuance of common stock valued at about \$1.4 million, with the number of shares being between 550,000 and 650,000.

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## Hitachi Mini Has 'Plus'

TOKYO—Hitachi Ltd. has unveiled its Hitac 20 mini-computer that incorporates a PL/I-like language called Programming Language for User's System (Plus).

The unit, basically an improved version of the Hitac 10 and Hitac 101, features microprogramming control and extensive use of LSI, the company said.

Modular in design, the system allows the floating-point arithmetic adapter, hardware debut adapter and I/O control adapter to be assembled in various combinations, Hitachi said.

Communications capabilities have been improved to handle a range of terminals "in-house," and the Hitac 20 can communicate with other

members of the Hitac family, the firm said.

Among the features of the in-house transmission system, which has a transmission speed of 50 kbit/sec, is a group polling method, said to reduce response overhead despite an increase in the number of terminals.

Cycle time is 650 nsec, and both medium- and high-speed floating-point arithmetic are available.

First deliveries are scheduled for this October. The price of a minimum configuration nondisk system, which includes 8K words of memory and typewriter, is \$14,850.

The minimum disk configuration costs about \$33,000 with 8K words, 2.5M word disk and typewriter.

## Survey in Germany Finds

# Potential Mini Users Unaware of Makers

By Vic Farmer  
of the CW staff

HANOVER, W. Germany—If a recent study by International Data Corp. Deutschland is any guide, minicomputer manufacturers may have a difficult time trying to break into the rapidly growing small business computer market here.

Robert A. Lachnitt, editor of *EDP Deutschland Report* (EDP/DR) recently surveyed over 400 German companies, each with fewer than 500 employees, to determine just how aware small company management is of the major minicomputer manufacturers. These firms all used some form of DP, either in an IBM System/3 type of system, magnetic card business machine or a minicomputer adapted for commercial work.

Lachnitt analyzed the present small computer market as a

three-pronged confrontation.

The large mainframes, such as IBM, are offering smaller systems to attack what has been the lucrative small systems business of such companies as Nixdorf. But now, into the small business computer market fray, the minicomputer companies have launched a full attack.

The problem, as Lachnitt sees it, is that the minicomputer firms such as Digital Equipment Corp. are just not known in the small end-user business market. These minicomputer companies have established themselves in the major scientific and process control markets, but exposure in those markets doesn't help the minicomputer manufacturer at all in the small business market, he said.

This means the minicomputer makers are faced with a long, hard battle to break into the smaller firm marketplace. In Germany, for example, DEC is number one in number of installations of minicomputers, followed by Dietz (the main German minicomputer maker), General Automation, Data General, Krantz, Texas Instruments, Unicom and Interdata.

This ranking does not include the number of installed process control computers.

But in the EDP/DR awareness study Lachnitt conducted, potential users indicated they thought the leaders in minicomputer systems were IBM first, followed by Siemens, Nixdorf, DEC, Hewlett-Packard, Honeywell-Bull and Univac.

The study further showed that 58% of the firms surveyed have never heard of DEC; 71% never heard of nor could recognize Dietz; 73% could not recognize Data General and 93% had never heard of General Automation.

Lachnitt also said the survey demonstrated smaller and less sophisticated users were more

sensitive to a computer supplier's image and, conversely, more sophisticated users were generally less sensitive to a firm's image.

The survey group could not

## International News

readily distinguish the differences between minicomputers, magnetic ledger card systems and small business systems, the study concluded.

This, Lachnitt explained, is why IBM and Nixdorf were listed as minicomputer makers by the respondents, although they do not offer minicomputers in the classical sense.

Lachnitt advised any minicomputer firm contemplating the small business computer market to consider heavily the cost of developing this new market, since the smaller prospective users are likely to have no awareness of a minicomputer as a possible answer to their DP needs.

## Aussie Bid Requests Come Without Details

SYDNEY, Australia—Although usually specific in its bid requests, the Australian Post Office (APO) said its actual requirements for new data entry systems are not now known.

The APO is looking for bids on equipment to replace existing paper tape systems, although the new units should prepare data in the format currently used, according to a report in *Pacific Computer Weekly*.

Although output will generally be on tape, the APO is investigating interfacing some of the systems directly with its Honeywell mainframes.

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## US-Japan Parley Set for August

TOKYO—The second USA-Japan Computer Conference will feature more than 100 presentations on topics in three interest areas: applications of pattern recognitions and image processing; artificial intelligence and its uses; and computer graphics.

The conference, set for August 26-28 here, will be sponsored by the Information Processing Society of Japan and the American Federation of Information Processing Societies (AFIPS).

Further information may be obtained from AFIPS at 210 Summit Ave., Montvale, N.J. 07645.

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## OEM Peripherals Group at Microdata Projects '75 Revenues at \$5 Million



Dave Carlson assembles tape drives.

IRVINE, Calif. — Microdata Corp.'s OEM Peripherals Group expects revenues of \$5 million in calendar '75, said Larry Ferguson, project engineer to the group.

The group was formed last fall to promote Microdata's 10-1/2-in. tape drive and 5M-byte disk drive. The reasoning was that larger volume, obtainable from OEM sales, would enable the firm to make the products at less cost, he explained.

Microdata already made tape and disk drives in-house last summer and the tapes about a year and a half ago, he said.

Initially, the marketing strategy is to be price competitive, he said.

The peripherals market seems to have firmed up somewhat in pricing, Ferguson said, with more firms adhering to published prices.

"We can afford to be here long enough to prove we're here," he said, noting that the group al-

ready has a couple of substantial contracts as a start.

Microdata considers the products very reliable, he said, noting it gets instant feedback from its Reality customers, whereas peripherals makers have to depend on word to filter through their OEM customers.

Although the firm does not plan to embark into other peripheral product areas, it does intend to extend the line of tape

and disk drives.

It is starting production of a 10M-byte cartridge disk drive, and 10 units will be placed in the field in March for evaluation.

Another possibility is supplying interface for specific systems such as Digital Equipment Corp. products. Currently, Microdata provides the units on an OEM basis without interface.

Thought is also being given to designing a "universal" interface



Microdata Disk Drives

using the Micro One, he said.

Microdata is also developing its own CRT, but this will be used

solely with the Reality system and will not be marketed by the group, Ferguson said.



## Contracts

General Electric's Data Communications Products Department has been awarded a contract by Datapoint Corp. for delivery of its Terminate 120 line/min printers which will be incorporated into Datapoint's existing product line.

Applied Digital Data Systems has been awarded a \$600,000 contract by Computer Automation, Inc. to supply 500 Comaul 580 CRT terminals over the next 18 months for inclusion in its Megabyte and Capable system.

Univac has been awarded a contract for software support services and data base management by the Environmental Protection Agency. The contract covers the Community Health Environmental Surveillance System which analyzes effects of Airborne pollutants on human health.

Zeta Research has received a contract totaling more than \$300,000 by the Finnigan Corp. for Model 150 plotters to be used in Finnigan's data systems which analyze organic compounds.

The Management Group, Inc. has been awarded a contract from the state of Maine for extended development of an on-line welfare eligibility/grant computation system for the Aid for Dependent Children (AFDC) Welfare Program.

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Charles E. Lamb, Senior Vice President, Computer Vision Engineering Systems, Inc., a subsidiary of Vantage Systems, Inc., Inc., Oakland, California.

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POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS
<b>ASSISTANT PROFESSOR</b> The Information Systems Department at SAN DIEGO STATE UNIVERSITY will have a full-time teaching position available in August, 1975. Candidates should hold the Ph.D. degree in information systems or in a related field and have college-level teaching experience. Subject areas include Introduction to Data Processing, FORTRAN, COBOL, Systems Analysis, Data Base Design and Management, and Information Resources Management. The University invites applications from all qualified persons of both sexes and of all ethnic backgrounds. Equal Opportunity/Affirmative Action Employer. Please send your resume to: Dr. William Sautter, Chairman Information Systems Department School of Business Administration San Diego State University San Diego, Calif. 92182 (714) 234-5316	<b>PROGRAMMER/ANALYST</b> John Jay College of Criminal Justice of New York seeks a highly motivated individual with 3-5 years Cobol and/or PL/I experience. Installation consists of IBM 370 under OS/VS1, with access to CUNY's 370/1585. Excellent opportunity for person interested in learning Teleprocessing. Outstanding fringe benefits. Bachelor's degree required. Please submit resume with salary history to: Director, Computer Center John Jay College 445 W. 38th Street New York, N.Y. 10018 <i>an equal opportunity/affirmative action employer.</i>	<b>EDP VENDORS &amp; EDP SALESMEN</b> Earn thousands of extra dollars by selling Computer, Typewriter, and other Word Processing Machine ribbons. Build a terrific income producing repeat business; starting now. Write CW Box 4301 787 Washington Street Newton, Mass. 02160	<b>PROGRAMMERS, ANALYSTS, SR. ANALYSTS..</b> We are a leading full-service interactive time-sharing firm growing by leaps and bounds. We've got a tremendous need for new talent to come on board at any level. We're state-of-the-art and widely acknowledged throughout the business community. If you have two or more years progressively responsible experience in data processing, are technically competent, personable and effective in dealing with internal users, clients and managers, we'd like to hear from you. We offer EXCELLENT salaries fully equated to responsibility, comprehensive benefits, and a stimulating results-oriented atmosphere dominated by young management. We're well-enough established to give you lots of room to grow, and small enough to give you visibility. If you're interested and qualified, please send resume establishing qualifications and earnings history, in confidence, to: N. BRAININ - Employment Manager  <b>NATIONAL CSS, INC.</b> 300 West Port Avenue - Norwalk, Conn. 06851 Please - System - Solutions Prompt replies to all resumes <i>from this Equal Opportunity Employer</i>	
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2-4 years experience designing and implementing applications of large-scale systems; data base oriented. Programming background in COBOL and/or PL/I under IBM OS. Background in financial applications, marketing and sales planning, operations research helpful. Relevant training required.

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Heavy experience developing and implementing data base and Information Systems applications, utilizing IMS-II and similar data base software packages. Experience in statistical applications, financial applications, marketing and operations research applications desired. Relevant training required; brokerage experience very helpful.

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3-5 years experience in designing and implementing applications on large-scale time-sharing systems; data base oriented. Programming background in COBOL and/or FORTRAN. TSO experience preferred. Background in financial applications or Operations Research helpful. Relevant training required.

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Experienced designers and analysts for newly established Financial Information System. Successful applicants should possess 2-4 years experience in the design and/or analytical phases of data base management. Experience in brokerage application very helpful.

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# PROGRAMMERS

## PROGRAMMER ANALYSTS

### SYSTEMS ANALYSTS

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Programmers

## PROGRAMMER/ANALYSTS

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- DATA BASE MANAGEMENT
- SYSTEMS PROGRAMMING
- APPLICATIONS PROGRAMMING

and, if you have at least a BS/BA and over 4 yrs. experience or MS/MA and over 2 yrs. experience in at least one of the following areas:

- Software Development and Support
- Inhouse Programming Consultation
- Systems Programming
- Applications Programming in Statistics, Data Base Management or Operations Research

CNA is an independent, non-profit, research institute engaged in operations research and systems analysis for the U.S. Navy and other government agencies. Liberal benefit program including 4 weeks annual vacation and a comprehensive relocation policy.

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REQUIRES: Programming experience and considerable knowledge of computer programming and of COBOL and/or FORTRAN languages. Ability to work independently and provide a critical analysis of existing or proposed systems or programs. Ability to thoroughly document computer programs. Must be a resident of Fairfax County or be willing to become a resident in one year.

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(Computer Industry)

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## SYSTEMS PROGRAMMER

The Fort Worth National Bank is seeking an OS Systems Programmer with a minimum of 5 years experience in OS operation and maintenance of IBM equipment in an OS/VS1 environment. OS/VS1 system tuning, JCL, MICR, ALC and BTAL desired. Degree preferred.

## PROGRAMMER/ANALYST

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## POSITION ANNOUNCEMENTS

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PROGRAMMER/ANALYSTS**  
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# Sperry Reports Record Sales, Net for Year

NEW YORK — With Univac bringing in \$1.3 billion in revenue, a 15% rise over the year-ago figure, Sperry Rand Corp. registered record earnings and revenues for the year ended March 31 as well as for the fourth quarter.

Univac led the company in total revenues and earnings, and commercial orders for systems were 16% ahead of last year, while its worldwide installed DP base reached \$6.3 billion, a 15% increase over the prior year, observed Chairman J. Paul Lylet.

Univac orders during the fourth quarter rose 22% above

those of the same 1974 period. Merging the Remington office equipment operations into Univac last August adversely impacted division results, but the problems of these operations are under control and we are beginning to see the benefits of our restructuring programs," Lylet said.

"We are forecasting continued growth in revenue and net income in fiscal year 1976, although the magnitude of increases may be smaller," Lylet said.

"Also, we anticipate the three-year pattern of consecutive rec-

ords for comparable quarters may be hard to sustain," he observed.

For the year, Sperry Rand earned \$131.4 million or \$3.81 a share, including \$5.4 million special credit for the sale of land, compared with a restated \$116.4 million or \$3.38 a share for 1974.

Results for 1974 were restated to reflect a change in accounting to expense R&D as incurred. The effect of this change was to reduce fiscal 1975 earnings by \$1.4 million and increase fiscal 1974 earnings by almost \$3.9 million, the firm said.

Revenue for the year reached \$3.04 billion compared with \$2.61 billion in 1974.

International revenue rose 21% over last year and accounted for 43% of the total revenue, the firm said.

During the fourth quarter, earnings rose 11% to \$38.4 million or \$1.11 a share compared with \$34.7 million or \$1 a share in the same period last year.

Revenue reached \$823.2 million, up 14% over the \$724.4 million in the same quarter in 1974.

Sperry's corporate backlog at the end of the year totaled \$1.85 billion, up 7% over last year.

New orders received in 1974 were just under \$3 billion and were up 11% in the fourth quarter.

# DEC Nine-Month Earnings Up a Bit From '74 Period

MAYNARD, Mass. — Digital Equipment Corp.'s third-quarter earnings were down on a 24% increase in sales while nine-month earnings eked ahead of last year's figure, \$28.6 million compared with \$28.4 million, on a 30% increase in sales.

Higher operating expenses in all areas of the company were cited as factors in the decline in third-quarter earnings, which nevertheless were ahead of those of the preceding second quarter. The mix of DEC's sales may be changing as the company said the educational, business and

laboratory markets continue as "stronger" elements of the total business while the OEM market is "relatively flat, and the industrial and larger scale computer markets are growing somewhat more slowly than planned because of general economic conditions," the firm said.

The outlook for these and other markets remains positive, DEC said.

## Worldwide Shipments

Worldwide shipments were in line with the firm's expectations, but new orders are increasing at a somewhat slower rate than a year ago, the firm said.

For the third quarter, revenues reached \$134.6 million compared with \$108.3 million a year ago, but earnings dropped to \$11.3 million or 95 cents a share compared with nearly \$12 million or \$1.01 a share a year ago.

In the nine months, revenues rose to \$373.2 million compared with \$286.7 million. Earnings reached \$28.6 million or \$2.39 a share compared with \$28.4 million or \$2.44 a share.

DEC's cost control program, begun earlier this year, has been maintained and is reflected in the results, the firm said.

Proceeds from the sale of \$75 million sinking fund debentures completed during the quarter have been used to repay outstanding domestic short-term indebtedness and the balance invested on a short-term basis in anticipation of further growth and future business requirements, DEC said.

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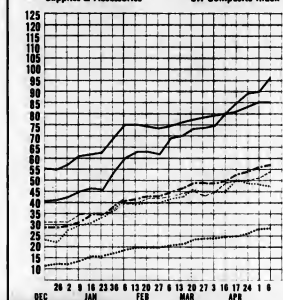


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## Earnings Reports

ITEL			ADVANCED COMPUTER TECHNIQUES		
Three Months Ended March 31			Nine Months Ended Dec. 31		
1975	1974		1974	1973	
Shr Erid	8.28	8.27	Shr Erid	8.18	8.13
Revenue	36,200,000	29,388,000	Revenue	4,077,000	3,312,000
Tax Crd	.....	180,000	Earnings	212,000	102,200
Earnings	2,100,000	2,568,000			

NATIONAL COMPUTER SYSTEMS			BUNKER RAMO		
Year Ended Jan. 31			Three Months Ended March 31		
1975	1974		1975	1974	
Shr Erid	8.85	8.84	Shr Erid	8.33	
Revenue	8,018,000	5,955,750	Revenue	871,745,000	78,923,000
Tax Crd	.....	124,500	Earnings	(108,000)	2,445,000
Earnings	433,200	440,100			



Computerworld Stock Trading Summary

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